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ORIGINAL ARTICLES

CHRONIC NEPHRITIS PRODUCED BY X-RAY*

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THE solution of many of the problems connected with chronic nephritis with hypertension has been awaiting the production in animals of a suitable progressive sclerosis of the kidneys. Numerous investigators have attempted by various means to produce such a nephritis. Uranium nitrate and other metallic renal irritants, injections of various bacteria, combina-

X-ray is correct which states that its destruction of tissue is, in part at least, due to its obliterative action on blood vessels then we have at hand a means of imitating what happens, according to one theory, in a progressive vascular nephritis. In the autumn of 1924 our experiments were started on rabbits. The first series, which is being reported here, comprises

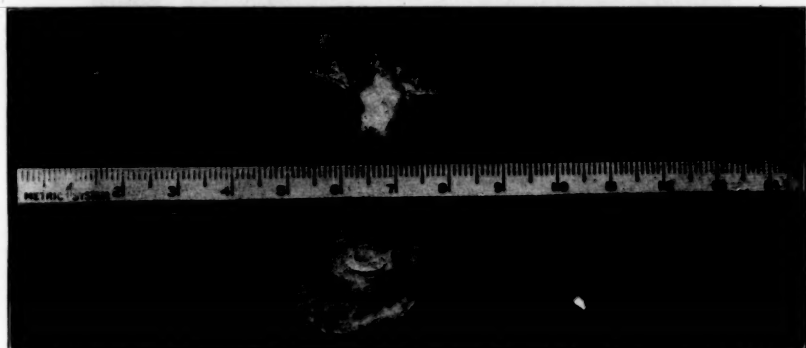


FIG. 1 illustrates the comparative sizes of the normal left kidney and the radiated right kidney of rabbit No. 26.

tions of these two methods, high protein feeding, etc., have produced some evidences of a chronic renal lesion. In none, however, has there been a satisfactory lesion suitable for use in the study of the problems of chronic nephritis.

We feel that we have been able by means of a very different method to produce in laboratory animals a progressive sclerosis of the kidney of marked degree and under controlled conditions. The results have been so satisfactory, and the method opens up so many paths of investigation, that we feel justified in publishing the following brief report of our results in our first series.

About two years ago it occurred to us that in the use of the X-ray might lie the solution to our problem. If that theory of the action of

twenty-eight animals. In each rabbit, under ether anesthesia, the right kidney was brought up into a flank incision and exposed to a dosage of X-ray, varying from twice to ten times the erythema dose. A few animals died. Most of them were killed. The duration of life varied from one day to five months after the X-ray treatment.

At autopsy it was possible to compare the radiated right kidney with the normal left kidney. The animal that died twenty-four hours after exposure to the X-ray showed an acute degeneration of the affected kidney. The acute lesions in other animals were characterized for the most part by slight swelling and pallor of the right kidney in gross. Microscopically the changes were apparently minimal. In some there was a little edema. The tubules near the surface seemed to be slightly degener-

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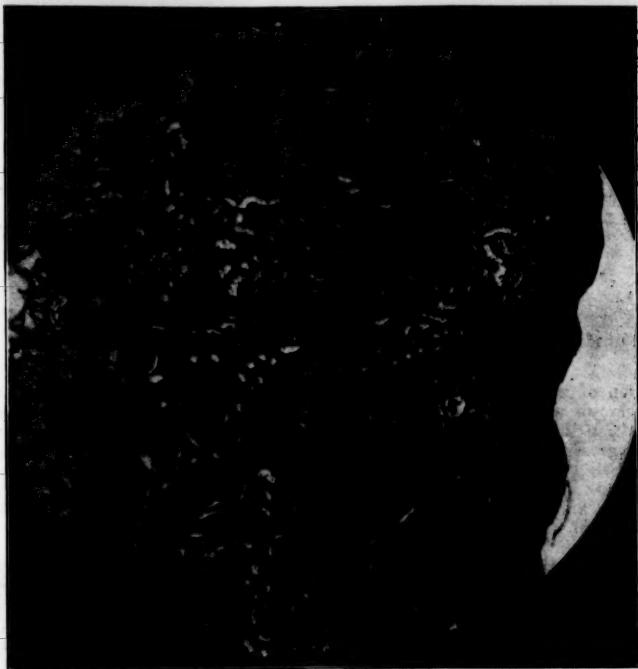


FIG. II. Photomicrograph of normal left kidney of rabbit No. 26.

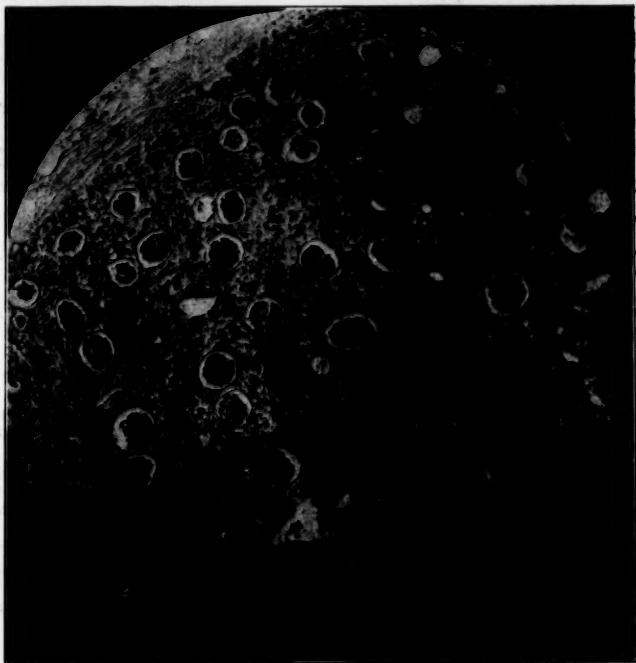


FIG. III. Photomicrograph of radiated right kidney of rabbit No. 26

ated in a few and there was a tendency to slight hyalinization of some glomerular tufts and tubular epithelium.

With the higher dosage and greater prolongation of the experiment chronic changes crept in. In the gross there was definite decrease in the size of the right kidney. Slight thickening of the small arteries, gradual destruction of tubules, thickening of Bowman's capsule, occasionally a damaged glomerular tuft, and a moderate amount of connective tissue appeared. Prolonging the experiment for a period of three or more months we were able to reduce the size of the affected kidney to half that of the control. In these advanced cases, illustrated

by the photos from Rabbit 26, there is a marked sclerosis of the kidney as can be seen by comparison of the two kidneys. The vessels are thickened. The tubules are to a large extent destroyed or undergoing degeneration. The glomeruli, though less affected, show capsular thickening, sclerosis of some tufts and other changes. Connective tissue is very prominent and there is some cellular infiltration.

Such a controlled lesion should throw much light on the problem of chronic hypertensive nephritis in man. Further studies are in progress in which a bilateral lesion is being produced.

A CLINICAL AND PATHOLOGIC STUDY OF TWENTY-SIX CASES OF DIABETES*

BY HOWARD F. ROOT, M.D., AND SHIELDS WARREN, M.D.

INTRODUCTION

EXPERIMENTAL and clinical evidence from Minkowski to Banting has demonstrated clearly that the essential pathology of diabetes mellitus is that of the pancreas. Allen's hypothesis that diabetes resulted from functional overstrain of the pancreas gave reason for the hope that with insulin treatment the removal of the burden from the pancreas might allow for regeneration with recovery in large measure of normal function. Recently Boyd and Robinson¹ have reported the case of a diabetic boy, long and carefully treated with insulin. He presented some clinical evidence of regeneration and after death by accident, a post mortem examination showed evidences of newly formed islands. The results here to be reported indicate that regeneration of the pancreas plays a greater part in the clinical course of diabetic patients than has been realized.

The 26 cases forming the basis of this paper were under the care of Dr. E. P. Joslin and in 25 instances of one of us (Root). As a rule they were treated at the New England Deaconess Hospital. The series is notable for the long period of observation and treatment of six of these, for the variety of types of diabetes represented, and for the use of insulin in about one-half the cases.

In Table 1 are given the chief clinical facts with a summary of the more significant pathologic findings. The cases have been arranged in the order of increasing duration with the exception of one placed at the end, because although only under observation 26 days, this patient undoubtedly had diabetes much longer.

*From the Medical Clinic of the New England Deaconess Hospital and the Pathologic Laboratory of the Boston City Hospital.

The pathologic findings with special reference to regeneration have been considered in detail in another article², but are also summarized here.

CLINICAL DATA

Etiology: The various factors commonly considered in the etiology of diabetes are represented in this series as follows:

A. Obesity. Every patient with the exception of one had been over weight prior to or at the onset of diabetes. This one patient entered the hospital so ill that no adequate history of his previous weight was obtainable. The range of deviation from standard weight was from + 2 per cent to + 73 per cent and the average for the group was + 32 per cent. The average of the maximum weights of the patients over 40 years of age was 41 per cent above standard.

B. Syphilis. Three patients out of 19 had positive blood Wassermann reactions, but of these only 2 showed pathologic changes characteristic of syphilis. In 1000 cases of diabetes, Joslin³ found 16 positive Wassermann reactions. In our series the percentage of positive Wassermanns is 16 per cent or 10 times as great. The number of cases in the two groups compared differs so widely that comment is withheld.

C. Heredity. Diabetes in a parent or grandparent was known in 3 cases, and in 2 others occurrence in other members of the family was known.

D. Infections. Acute infections occurring within 6 months of the onset of diabetes are as rare in this group of patients as in the larger series⁴. In Case No. 870, the diagnosis was made by the discovery of sugar in the urine during the course of pneumonia. Case No. 2463 had tonsillitis and No. 1870 had a cold within

a few months of the onset of diabetes. In the past histories measles occurred 17 times, pertussis 13, tonsillitis 11, scarlet fever 7, diphtheria and typhoid fever twice each, and rheumatic fever once.

Lesions in close proximity to the pancreas are represented by one case (No. 2559) of duodenal ulcer, and 7 cases (27 per cent) of gall stones and chronic cholecystitis. The lack of accurate

adrenals were enlarged, weighing 19.5 gms., and small ovarian cysts were present. The liver contained 5.5 per cent fat, or a total of 99 gms., and no glycogen by either chemical or pathologic tests. The insulin content of various tissues is given below in Table 3. Here is an instance of acute disease in 2 glands of internal secretion and disorder in 2 others. In Case No. 3240 the onset of diabetes occurred at puberty.

TABLE 1
26 DIABETIC AUTOPSIES

Marginal No.	Case No.	Age at death	Duration of diabetes	Clinical Data		Cause of death
				Insulin		
				Units daily	Duration of treatment	
Yrs.	Yrs.	Days				
1.	4289	29.5	0.2	40	22	Septicemia
2.	3592	64.0	0.5+	47	15	Multiple abscesses
3.	2559	55.0	0.6	0		Duodenal ulcer
4.	3240	15.3	0.7	60	0.3	Coma
5.	2720	19.2	0.9	0		Perinephric abscess
6.	2446	36.9	1.1	100	1	Pneumonia, coma
7.	1870	15.0	1.6	0		Coma
8.	1907	24.0	1.8	0		Inanition
9.	3210	65.0	1.8	0		Angina pectoris
10.	2463	32.4	2.7	0		Abscesses of liver
11.	4142	47.6	3.3	12-15	4	Perinephric abscess
12.	2988	56.3	4.0	91	7	Pneumonia and pericarditis
13.	1305	16.0	5.5	10	75	Coma
14.	2479	69.0	9.0	0		Chronic myocarditis
15.	3679	46.0	9.5	5-30	34	Appendicitis
16.	896	69.2	10.7	60	120	Cancer of pancreas
17.	3798	64.0	11.0	15-30	10	Gangrene and septicemia
18.	705	66.0	14.0	3-6	6	Angina pectoris
19.	1419	53.3	14.6	50	1	Appendicitis
20.	263	48.7	14.8	8-30	395	Chronic nephritis
21.	870	53.2	16.9	0		Coronary thrombosis
22.	3176	58.5	17.3	12-15	8	Phthisis
23.	127	62.0	25.0	10	90	Coronary thrombosis
24.	3242	52.0	25.0	51	6	Septicemia
25.	1924*	53.9	30.2	0		Gangrene and septicemia
26.	3468	61.0	0.1	7-10	12	Gangrene and septicemia

*Restricted autopsy.

data as to the duration of these conditions prevents conclusions as to their etiologic relationship, but shows the importance of searching carefully for evidence of such complications in all cases of diabetes.

E. Endocrine disorders. Case No. 4289 entered the hospital with acute thyroid "storm" and diabetic coma. With Lugol's solution and insulin the patient recovered from both these complications to succumb in two weeks to septicemia arising from a furuncle. Her diabetes was of recent onset and was preceded by goitre and symptoms of hyperthyroidism. At autopsy a hyperplastic thyroid gland containing 0.9 mgm. iodine per 100 gms. gland was found. The

Course: The extremes of life furnished the cases of shortest duration, as shown in Table 2. Diabetes is more severe in the young and in the

TABLE 2

AGE AT ONSET VERSUS DURATION		
Decade of onset	No. of cases	Average duration, years
0-19	4	2.2
20-29	5	14.9
30-39	6	13.6
40-49	4	9.8
50-59	5	7.4
60-	2	.9

ordinary course of events the expectation of life in the old is short.

Among the 9 deaths within 2 years of onset of the disease are included 2 from coma and 1 from inanition. Four others had coma or severe acidosis within 2 weeks before death from infection.

Acidosis and coma can also occur in cases of longer duration, but grave dietary errors are more often found as the exciting factors. Thus

under the observation of Dr. Joslin for periods varying from 7 years to 17 years, 4 had their onset between the ages of 34 and 39 years. A family history of diabetes was present in 3, and gall stones in 2; both factors may predispose to mild diabetes. The mildness of their diabetes was apparent to the end and in each of these 6 cases death was due to a complication rather than directly to diabetes. Yet such mild diabetes

TABLE 1
(Concluded)

Pathology											
Pancreas				Heart			Aorta	Glycogen		Marginal No.	
Size	Number	Condition	Islands of Langerhans	Acinar sclerosis	Weight	Sclerosis of coronary arteries	Sclerosis of myocardium	Arterio-sclerosis	Liver		Kidney
										Gms.	
30 gms.	Normal	Lymphocytes		0	365	0	0	0	0	0	1.
116 gms.	Normal	Hyalin ++		+	433	0	0	+	+	+	2.
	Normal	Hyalin +++		0		++	0	+++	+	+	3.
Small	Few	Normal		0		0	0	0	0	0	4.
Small	Normal	Lymphocytes		0		0	0	0	+	+	5.
50 gms.	Normal	Normal		0	280	0	0	+++	+	+	6.
Small	Normal	Lymphocytes		0		0	0	0	+	+	7.
Small	Normal	Hyalin ++		++		0	0	+	0	0	8.
Small	Few	Hyalin +		++	250	+++	++	+++	0	0	9.
	Normal	Normal		++		0	Hydrops	++	+	+++	10.
80 gms.	Normal	Hyalin +++		+	290	0	0	+	+	+	11.
Normal	Normal	Hyalin ++		++	325	0	+	+	0	+	12.
Small	Normal	Sclerosis +		++		0	+	+	0		13.
Normal	Normal	Normal		++	325	++	++	+++	+	++	14.
Small	Few	Sclerosis +++		+++	320	0	+ Hydrops	+++	+	+	15.
Cancer	Normal	Hyalin ++	Cancer	+	330	+++	+++	+++	+	+	16.
180 gms.	Few	Sclerosis +		++	315	+++	++	+++	0	0	17.
	Normal	Hyalin ++		++	520	+++	++	+++	+	+	18.
340 gms.	Normal	Hyalin ++									
		Sclerosis +		+	360	0	0	++	+	+	19.
70 gms.	Few	Hyalin +++		+	340	+	+++	++	0	0	20.
Normal	Normal	Hyalin +++		+	350	+++	+++	+++	0	+	21.
	Normal	Sclerosis +++		+		0	+	+	+	+	22.
40 gms.	Few	Normal		++	335	+++	++	+++	+	+	23.
	Normal	Hyalin +++		++		+	0	+	0	0	24.
	Normal	Hyalin ++		+++				+	+	+	25.
	Normal	Sclerosis +		++	610	+++	+++	+++	0	+	26.

in the 17 cases with duration over 2 years there occurred but one death in coma and that in a boy, who while taking an increased diet omitted insulin and developed infection. The mildness of these cases of long duration is not, however, a guarantee of safety, for 6 cases had severe acidosis during the course of infections.

The average duration of the diabetes was 9.2 years for the cases treated with insulin, as compared with 7.3 years for those treated without insulin. The short period of insulin treatment, as compared with the treatment by diet alone, does not permit conclusions as to its effect on the duration of life.

Cases Long Under Observation: Of 6 patients

deserves careful treatment. In each instance marked changes in the pancreas were present at autopsy and 2 of the 6 developed acidosis bordering on coma coincidently with acute infections.

Acidosis and Coma: In 9 of the 10 patients who had had severe acidosis, but not coma, the condition was brought on by an acute infection. That one exception was Case No. 1907 who had severe diabetes and broke his diet.

Of the 6 cases that died either in coma or within 1 month of recovery from coma, 1 omitted his insulin and had an infected hand, 2 broke diet, 1 developed lobar pneumonia and another broncho-pneumonia and acute pericarditis, and 1

suffered from acute hyperthyroidism, death resulting from septicemia. Four of these deaths occurred in those whose diabetes had lasted less than 1 year and 7 months.

The value of an autopsy in diabetic patients cannot be overstated. Clinical diagnosis is frequently mistaken, and especially in such grave conditions as severe acidosis the cause of death cannot often be attributed safely to diabetic coma alone without an autopsy.

Arteriosclerosis (Atherosclerosis): The clinical evidence of widespread arterial disease was clearly manifest, although no single criterion of its existence was found reliable. The arterial tension was variable. The systolic blood pressure in only 2 cases exceeded 200 mm. Hg. In 9 cases single observations ranged between 160 and 190 mm. Hg. but other readings in these cases were normal. Of 6 cases under observation 7 years or longer and exhibiting advanced generalized arterial disease, with vascular nephritis, in 2 cases the systolic pressure was never observed above 145 mm. Hg. Palpation of the peripheral vessels, especially of the dorsalis pedis, popliteal, radial and brachial arteries, ophthalmoscopic examination of the retinal vessels, a careful cardiac examination, and tests of renal function were all necessary to gain a picture of the amount and character of the vascular disease present.

Gangrene: Seven patients developed gangrene of a foot or leg. They averaged 44 per cent overweight at their maximum as against 26 per cent for the cases which did not have or had not yet developed gangrene. In no case did gangrene occur without antecedent obesity. Advanced arteriosclerosis, slight trauma, subsequent infection, delayed treatment, and finally gangrene summarize the history of 6 cases. Embolism from an intracardiac thrombus caused the seventh case of gangrene.

Coronary Sclerosis and Myocarditis: Case No. 870 died suddenly of coronary thrombosis 2 weeks after operation for gall stones. Case No. 3210 died of angina pectoris 2 hours before she was to have undergone operation for gangrene. Feeble and crippled, she had not exerted herself sufficiently to bring on attacks previous to this first and last one. The comparative inactivity of diabetic patients in the past has masked the true condition of their hearts. Now their greater longevity and activity give opportunity for the development of degenerative heart disease and cause for the production of symptoms.

The average duration of diabetes in the 5 cases whose deaths were directly due to heart disease was 13.6 years.

Cholelithiasis and Cholecystitis: In Table 3 are given case numbers of patients with cholelithiasis and cholecystitis. In only 1 case, No. 870, had the diagnosis been made during life and operation performed. In 32 per cent of the cases over 25 years of age cholelithiasis or cholecystitis

were present, and in all it was present in 27 per cent.

Joslin⁵ has pointed out that diabetes associated with gall stone is mild. The average duration of 5 of our cases was 13 years. Whether the diabetes was secondary to the gall-bladder disease cannot be proved from the clinical histories or from any pathologic examinations. The association of gall-bladder disease and coronary disease is striking. Two of these cases died of angina pectoris, 1 with coronary thrombosis, 1 had an old healed infarction of the left ventricle and 2 had advanced coronary sclerosis and myocarditis. Here again is a suggestion of the harmfulness of an excess of cholesterol in 2 types of tissues, which will receive comment later. The conception of a local and temporary injury to the pancreas by extension of infection from the gall bladder and of ensuing regeneration of the pancreas, when the original source of the infection has subsided, helps to explain the remarkable instances of improvement in diabetes after the removal of gall stones, cited by Allen and Joslin.

TABLE 3
GALL-BLADDER DISEASE AND DIABETES

Case number	Duration of diabetes, years
705	14.0
870	16.9
1419	14.6
2479	9.0
3210	1.8
3468	0.1
3798	11.0

Preventable Deaths: Three of the deaths from coma were clearly preventable. Four of the 5 deaths from septicemia, as well as the death of Case No. 3592, could have been avoided by prompt treatment of minor traumata of the extremities. The 2 deaths from perinephric abscess could probably have been prevented with ordinary care of furuncles. A total of 10 deaths were avoidable by reasonable care and thus indicate that with more widespread knowledge of diabetic complications in hospital and home its duration will increase.

PATHOLOGY*

Pancreas: The weight or estimated size of the pancreas is of little value in determining the amount of pancreatic substance owing to the great variation in the connective tissue and fat present in the organ. Thus of 2 pancreases weighing 30 and 240 gms. respectively, neither contained much pancreatic tissue, and both came from women weighing more than 200 pounds. No attempt was made to count the islands of Langerhans.

*Note: In nearly all cases autopsies were performed within 3 hours after death.

gerhans, owing to the inaccuracy of any feasible method. In 6 cases of our series of 26 the islands appeared to be distinctly less numerous than in normal pancreases. No one distinctive lesion of the islands was found in this series. In 13 cases varying degrees of hyalinization of the islands were seen and in only 1 of these cases was the patient under 45 years of age. Five showed more or less sclerosis of the islands, in 5 occurred some lymphocytic infiltration about scattered islands, and there was no demonstrable pathology in the islands of 4. The islands of 3 showed the type of enlargement described by Cecil as adenomatous. In the few instances in which we found changes in the islands suggesting hydropic degeneration, post-mortem change could not be ruled out. The most likely case, No. 1870, a boy only 15 years old, died in coma after diabetes of short duration and was autopsied within 1 hour. No hydropic degeneration was apparent.

One important feature of the pathologic changes is the wide variation in the condition of the islands in the same pancreas and even in the same section. We found no pancreas in this series without a greater or less number of apparently normal islands, no matter how severe the clinical features or how marked the changes in some of the islands. Owing to the type of fixation of some of the tissues, Bensley's neutral gentian stain for the granules of island cells could not be used in all cases. Through the courtesy of Mr. Bowie of Toronto we have been able to use his modification of Bensley's stain for the island cell granules in cases where only Zenker-fixed material was available and otherwise specific granule stains would have been ineffective.

The acinar tissue of the pancreas presented varying degrees of sclerosis independent of pathology in the islands. It is worthy of note that the acinar sclerosis is not apparent with 2 exceptions in any case much under 2 years' duration, even though the islands may show considerable change. In these 2 cases an accurate history of the onset could not be obtained, and the duration was probably much longer than given. We could demonstrate no difference between the pancreas of a patient who had received insulin and those of patients under dietary treatment alone, except that we have the impression that in Case No. 263, treated with insulin for 13 months, there are more normal islands than would ordinarily be the case in a diabetic and in Case No. 896 there was evidence of newly formed and very numerous young islands.

No distinctive lesion in the young, uncomplicated cases of diabetes was found as might be expected if there were one definite causal agent giving rise to the disease. No correlation between diabetic coma and pathology was found.

Heart: Clinically, damage to the myocardium, chiefly through disease of the coronary ar-

teries, seems more common in diabetes than in similar age groups from the general population. Of our 17 patients over 40 years of age, 3 had extensive healed infarcts in the wall of the left ventricle, 1 an aneurysm of the wall of the left ventricle; in 5 there was extreme sclerosis of the myocardium (including 2 of the cases of infarct mentioned above), in 3 moderate sclerosis and in 5 no sclerosis. The coronary arteries were correspondingly affected in these patients. In 2 cases there was occlusion of a main branch of the coronary artery, in 1 the left branch of the coronary artery was practically occluded, in 7 there was marked coronary sclerosis, moderate sclerosis in 2, slight in 2, and no evidence of coronary disease in 6. In 2 of the negative cases a single microscopic section of the heart wall was the only tissue available.

Aorta: Arteriosclerosis of the aorta was found in every case above 30 years of age, generally accompanied by coronary sclerosis except where it apparently preceded the changes in the coronary vessels. Thus in Case No. 1305, a 16 year old boy, a few atheromatous plaques were present in the aorta. Case No. 2463, a man of 32 years, also showed marked atheroma of the aorta. The most extreme degrees of calcification occurred in the abdominal aortas yet with little change in the arch except in the 2 cases of syphilis.

Liver: Fifteen of the cases showed the characteristic presence of glycogen within the nuclei of liver cells. Nine of these cases had received insulin.

Gall Stones: Among the 21 cases over 25 years of age at death, 6 had gall stones and a seventh had chronic cholecystitis with adhesions and obliteration of the gall bladder.

Kidneys: Chronic vascular nephritis was present in 78 per cent of the cases over 45 years of age, thus corresponding with the amount of general vascular disease.

Glycogen: Forty per cent of the cases treated with insulin showed no glycogen in the liver cells or in the epithelial cells of Henle's loops, whereas in only 1 of 9 cases not treated by insulin was glycogen thus absent. The absence of glycogen in Henle's loops is remarkable and this finding in the insulin treated cases must be looked upon as significant. It is not to be attributed solely to difference in severity of the disease. Even the mildest cases not insulin treated, e. g. Cases Nos. 870 and 1924, showed glycogen in Henle's loops, whereas young severe cases (treated with insulin e. g. Nos. 3240 and 4289,) showed none.

Insulin Content of Tissues: In Table 4 are given the results of analysis of various tissues in 3 diabetic cases and of the pancreas in 1 non-diabetic case, compared with analyses of 6 cases reported by Baker, Dickens and Dodds, autopsied within 3 hours of death.

From so small a series of analyses carried out

under the handicap of transporting specimens a great distance we cannot attempt to draw general conclusions. It is, however, striking that although greatly reduced in amount, insulin was present in both Case No. 127 and 3592, whose pancreases showed marked degenerative change. The duration of diabetes in Case 127 was known to have been 25 years and of Case No. 3592 was 0.5 years. In Case No. 4289, a young woman with diabetes of recent onset but complicated by primary hyperthyroidism, coma and septicemia, the pancreas showed almost no pathologic change, and insulin was present in considerable amount. It is true that she had received large doses of insulin during the 3 weeks preceding death. Because of concurrent hyperthyroidism she had also received Lugol's solution, 30 c.c. in 15 days. Whether this treatment had improved the production of insulin,

against an infectious origin for the disease and the character of such lesions as may be present does not suggest the result of invasion by organisms. Indeed, one wonders whether the morphologic changes in the islands may be the result rather than the cause of the disease.

Whatever the cause may be, it seemingly acts over a long period of time, perhaps throughout the duration of the disease. The pathology which we find in the pancreas at autopsy rarely represents the initial damage to the organ, but rather the result of a long struggle between the regenerative activity of the pancreas and the degenerative changes caused by the diabetogenic factor.

Evidence of the power of the pancreas and of the islands' tissues in particular to regenerate after acute injury is easily obtained. Thus in a pancreas from a non-diabetic patient dying of lobar pneumonia we found numerous mitotic fig-

TABLE 4
INSULIN CONTENT OF HUMAN TISSUES*

Case number	Cause of death	Units of Insulin per 100 grams tissue					
		Pancreas	Liver	Kidneys	Heart	Thyroid	Spleen
Diabetic*							
127	Gangrene, Coronary Thrombosis	14.7	1.2	1.6	1.1		1.0
3592	Multiple Abscesses	2.5	0.9	1.9	2.2		2.2
4289	Septicemia	25	3.0	10	3.0	9.0	
Non-diabetic*	Cancer of Pancreas	70					
Baker, Dickens and Dodds	Pulmonary Embolism	87.0	25.0	116.6	—	—	90.0
	Myocardial Degeneration	108.0	—	11.5	—	—	—
	Diabetic Coma	42.5	16.3	—	—	—	—

either directly or indirectly, is of great interest. Certainly great clinical improvement in both her diabetes and thyroidism occurred coincidentally with the use of insulin and Lugol's solution.

The presence of insulin in the other tissues is clearly shown, whether due to transfer from the pancreas or by production within these other tissues is uncertain. Best, Smith and Scott² conclude that insulin may be a constituent of every cell which metabolizes carbohydrate and that the islands of Langerhans may be specially developed structures which supply active material when the demand is too great to be met by the insulin-producing power of the individual cell. It remains to be seen whether any diabetic is so severe as to have lost entirely the power of producing insulin.

DISCUSSION

Obesity stands out prominently among the possible etiologic factors, although syphilis, acute infections, disorders of endocrine glands, and local lesions about the gall bladder and duodenum may play a part. The variation and inconstancy of the pancreatic lesions argue

ures in the island cells, as high as 7 mitoses in a single island. Mitotic figures can occasionally be found in the island cells of patients dying of diphtheria. At times necrotic cells are found. This injury and subsequent repair not only indicate the regenerative power of the pancreas but perhaps explain the transient glycosuria occasionally encountered in acute infections.

Similarly injury to the islands may explain the severe drop in sugar tolerance noted in diabetic patients during acute infections. The partial, and sometimes complete re-establishment of the former level of sugar tolerance following recovery from the acute process, may well represent the result of regeneration of the island cells.

Bensley* believes that under appropriate conditions the capacity of the pancreas for regeneration is 100 per cent.

In Case No. 896, whose diabetes had lasted for 14 years and who had been under insulin treatment for 5 months receiving 15 to 100 units daily with gradual decrease of insulin requirement, there is evidence of regeneration of the islands. No acinar tissue is present. The bulk of the pancreas is occupied by a carcinoma from which the patient died, but the tail is not invaded by the tumor. Here the islands are

*We are indebted to Dr. C. H. Root, Toronto, Canada, for these analyses.

closely packed. Some show a moderate degree of hyalinization but most are entirely free from hyaline or other degenerative changes. Columns of cells extend out from the islands into the surrounding stroma, and in places entire low power fields are made up of island tissue. There are more islands than could be accounted for by their concentration through contraction of the stroma of the pancreas following destruction of the acinar tissue.

In any disease as insidious in onset and as chronic as diabetes, with pathologic changes largely restricted to one portion of a single organ, one should not expect any striking evidence of either destruction or regeneration. The lesions in diabetes are not infectious but toxic in origin. Their course is extremely chronic, and consequently the attempts at regeneration are slow. Mitotic figures would hardly be expected under the circumstances.

As a rule all toxic lesions of the same organ resemble one another. This is seen in toxic myocarditis or central necrosis of the liver. But in the islands of the pancreas showing either hyalinization or sclerosis, practically every stage from masses of hyaline or dense connective tissue imbedded in the stroma, representing destroyed islands, to apparently normal islands can be found. It is difficult to conceive of a toxic substance of very chronic action or of a long continued functional strain which would totally destroy one island and completely spare the next. Much more logical is the assumption that we are dealing with a gradual destruction of islands, a formation of new islands to replace them, exposure of these to the toxic substance with consequent pathological change and still more islands formed to take their places. The apparently normal cells found represent those most recently formed. In unfavorable cases the destructive process wears down the regenerative powers of the organ and the end comes, usually from some secondary cause because the diabetic whose death can be attributed to complete loss of islands from the pancreas is rare if, indeed, he exists at all. Certainly there was no such death in this series of 26 autopsies.

Hemochromatosis, or "bronze diabetes," gives us an excellent opportunity to test this assumption. In this disease a known injurious agent, hemofuscin, derived from hemoglobin, is deposited in various cells of the body, where it changes to hemosiderin. Eventually the accumulated pigment causes necrosis of the cell containing it. The liver is the first site of deposit, but as its cells become filled the pancreas also receives the pigment.

In those cases of hemochromatosis where the pancreas has become seriously involved before death, diabetes occurs. If the pathology referable to the pigment cirrhosis of other organs be disregarded, this diabetes differs in no whit

from diabetes mellitus except that the course is more rapid.

Yet in studying several cases of bronze diabetes the same variation in involvement of the islands is found as we have mentioned in our cases of diabetes mellitus. The lesions vary from the remains of islands represented by clusters of pigment-loaded endothelial leucocytes and fibroblasts in the stroma to islands without pigment and apparently normal. The conclusion is inevitable that new islands are being formed to take the place of those destroyed by the pigment deposits. Further to substantiate this evidence, occasional mitotic figures can be found in the cells of the younger, pigment-free islands.

The acinar tissue of the pancreas as well as the islands is affected by the pigment, and the same evidence of regeneration is offered by the acinar cells as by those of the islands.

The well-established evidence of destruction and regeneration of parenchymal cells in the liver offers a striking parallel to the changes in the pancreas in hemochromatosis. Just as in the liver the parenchymal cells show every stage from newly-formed pigment-free cells through those containing hemofuscin and those containing hemosiderin to necrotic cells the same steps can be traced in the acinar and island cells of the pancreas.

The analogy is complete if we substitute diabetes mellitus for hemochromatosis and hyaline formation in the islands for pigment deposit in the island cells.

There is no reason to doubt that the increased fibrous tissue, noted in the pancreas in some cases of diabetes mellitus, accumulates in the same way as the fibrous tissue in cirrhosis of the liver. The parenchymal cells, sometimes of the islands, sometimes of the acinar tissue, or of both, are killed and disappear. Their stroma remains behind. The parenchymal cells regenerate and new stroma forms to support them. In this way the fibrous tissue gradually increases in amount. The increased fibrous tissue noted in the pancreas in some cases of diabetes is therefore not due to a simple proliferation of the interacinar and interlobular connective tissue. Probably in most cases there have been injury and regeneration of the acinar tissue as well as of the islands.

This conception is consistent with the clinical facts in this series and explains some of the frequently puzzling features. The relative frequency of coma during the first 2 years of diabetes has often been noted. Seventeen of 33 cases of coma reported by Joslin, Root and White¹ occurred during the first year of the disease. Although usually explained by the patient's ignorance of means for its prevention, another factor must be considered, namely the capacity for regeneration may have been overwhelmed by the unknown toxic process at a

time when the body metabolism was on a plane not yet adjusted to the disease. Especially in the young is this true for in them the metabolic requirements of growth add to the strain. In cases of longer duration in which regeneration has afforded the protection of fresh insulin-producing tissue, coma is induced only by gross dietary errors or by serious infections.

The involvement of acini as well as the island tissue explains the results of Jones¹⁰ and his co-workers, who found evidence of disturbed external secretion of the pancreas in diabetes.

It becomes clear how the vast majority of cases of diabetes are mild or in the course of time become mild.

Although clinical and pathologic evidence of an infectious origin of diabetes is slight, the effect of intercurrent infections is definite. The low insulin content of the pancreas in cases of death from infections suggests diminished production. Other explanations suggest themselves, such as inactivation of insulin by the infectious process, or a toxic effect on the cellular tissues which renders them incapable of utilizing insulin. Epstein¹¹ has recently proposed an explanation of the mechanism of diabetes dependent on changes in permeability of the capillary walls which permit neutralization of insulin in the blood stream by trypsin. He therefore regards the insulin found in tissues of diabetic patients as largely inactivated. Carlson¹² controverts this explanation. Whatever the explanation, the improvement in tolerance after recovery from an acute infection is often most striking.

Aside from the pathology of the pancreas, the changes in the blood vessels of diabetic patients and in the myocardium are of interest. It has long been held that the diabetes of middle age and old age might be secondary to arteriosclerosis, but the occurrence of atheroma in the young, as in Case No. 1305, and after diabetes of long duration in which the onset was in youth, suggests that arteriosclerosis may result from diabetes.

Aschoff¹³ has recently restated the "wear and tear" hypothesis of the method of development of atherosclerosis, which he attributes to Virchow¹⁴. In its earliest stages there appears a loosening of the connective tissue ground substance of which the intima of the vessels is largely composed. This loosening or separation of the cells is due to increased imbibition of plasma. The connective tissue cells swell and enlarge. With the thickening of the intima produced by a new formation of connective tissue, a deposit of liquid substances, chiefly cholesterol esters, occurs in the plaque favored by high lipid concentration in the plasma. They are then split up, saponified and calcium soaps are formed. Eventually with the advent of phosphates in the circulating fluids, hard calcium phosphate is formed. Aschoff regards the

process chiefly from a mechanical point of view as due to wear and tear resulting in stretching of the vessel walls, as best seen in the elastic type of arteries, but involving a disorder of supporting tissues occurring in other tissues as well as the vessels. The process in the vessels is therefore encouraged by unusual strain and also by a high lipid content of the plasma.

This conception is a singularly plausible one for application to this series of cases in which marked obesity imposes the additional vascular strain and diabetes produces the lipoidemia. Thus in Case No. 1305, a boy with diabetes of five years duration, a series of blood analyses for three years showed an increase in blood fat of from 10 to 200 per cent above normal. In 8 of 9 cases analyses of the blood fat showed an increase in total lipid substances of 20 to 200 per cent and of these patients 6 had definite atherosclerosis. Three cases, two boys and a young man, who showed no sclerosis had had diabetes less than two years. Gray¹⁵ has shown the unfavorable prognostic significance of such increases in blood fat.

Bloor¹⁶ considers that one effect of insulin may be to increase the permeability of cell membranes so that an easier diffusion of lipid molecules results in a lowering of the blood lipids. It will be important to observe the incidence of atherosclerosis in cases of diabetes under prolonged insulin treatment.

The increased cholesterol content of diabetic plasma may also have some relation to the occurrence of gall stones. In 4 cases of this series large single stones occurred. In Case No. 3592 two large stones consisting of radial cholesterol centers with superimposed layers of calcium-pigment-cholesterol, suggested a primary cholesterol stone deposited as a metabolic process due to the increased cholesterol content of the plasma and bile. Such stones encourage secondary infection of the gall bladder, according to Aschoff¹⁶, which by extension to the pancreas may play some part in the clinical course of diabetes.

SUMMARY

- (1) The clinical and pathologic findings in 26 cases of diabetes mellitus are presented.
- (2) Cases of long duration and observation are included, as well as acute cases of short duration.
- (3) The causes of death in 22 of the 26 cases were complications of diabetes rather than the disease itself. Ten of the deaths in our opinion, in which Dr. Joslin concurs, were preventable.
- (4) Arteriosclerosis was present in 20 cases. Gangrene occurred in 7. Coronary sclerosis and myocarditis were present in 11 cases. Vascular disease was more closely related to the duration of diabetes than to the age at onset of the disease. Cholelithiasis and cholecys-

titis occurred in 32 per cent of the cases over 25 years of age.

(5) Thirteen cases show hyalinization of the islands of Langerhans. Only 1 of these cases was under 45 years old. Five show varying degrees of sclerosis of the islands. In 3 more there is slight lymphocytic infiltration about scattered islands, and the islands in 5 appear normal, though decreased in number in 2 of these 5.

(6) Apparently normal islands are present in all diabetic pancreases examined, no matter how badly damaged the bulk of the islands may be. In 2 cases, insulin-treated over 5 months, there seem to be more islands of normal appearance than in cases under dietary treatment alone.

(7) The character of the lesions in the islands of Langerhans suggests a toxic origin acting over a long period of time or a prolonged functional strain.

(8) In hemochromatosis there is definite evidence of regeneration of both the acinar tissue and island tissue of the pancreas. The type of diabetes in hemochromatosis is the same as that in diabetes mellitus.

(9) The increased fibrous tissue found in certain pancreases in diabetes is due to destruction of island or acinar cells or both, with persistence and condensation of their stroma. The parenchymal tissue regenerates and forms new stroma, with resulting increase in connective tissue.

(10) The acinar tissue of the pancreas does not show evidence of increased fibrosis in cases of diabetes of short duration.

(11) Analyses of the insulin content of various tissues are presented.

(12) Insulin treatment decreases the frequency with which glycogen is found in liver nucleolus cells and in the epithelium of Henle's loops.

(13) The influence of increased blood lipoids, especially cholesterol, upon vascular disease and cholelithiasis is suggested.

CONCLUSIONS

(1) A new interpretation is offered of the pathology of the pancreas in diabetes mellitus.

(2) The long-continued action of an injurious agent (or possibly excessive functional activity) causes a gradual destruction of island, and at times of acinar cells. New cells are formed to take the place of those destroyed, only to be exposed to the injurious influence with consequent pathologic change. Their injury is followed by the production of more new cells.

(3) The rarity of death from uncomplicated diabetes in cases of long duration is consistent with the conception of regeneration of the islands of Langerhans.

(4) The first 2 years of the disease constitute the danger zone, during which period special effort should be made to protect the patient against coma.

(5) The disturbed carbohydrate metabolism giving rise to abnormal fat or protein metabolites may be a contributing cause of the high incidence of vascular disease in diabetic patients.

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AN ATTEMPT AT THE DIFFERENTIAL DIAGNOSIS OF LATERAL SINUS INFECTION*

BY GEORGE L. TOBEY, JR., M.D., F.A.C.S.

The object of this paper is to review briefly the symptomatology of lateral sinus thrombosis, and to present for your consideration the results of our studies of the dynamics of the spinal fluid and its practical application in sinus thrombosis.

Cases of lateral sinus infection have apparently been on the increase during the last few years, due either to our increase in knowledge resulting in more frequent correct diagnoses, or to the type of infection which has been prevalent since the "flu" epidemic of 1918.

It is presupposed that there has been, within

a relatively short time, or that there is present an infection of the middle ear itself, or middle ear and mastoid. We have never observed, nor are we able to find authentic instances of lateral sinus thrombosis in the absence of aural infection, excluding fractures of the skull, and meningitis. Trendelenberg, in 1908, first brought to our attention a case of septic thrombosis of the jugular vein as a result of pharyngeal infection. This was again brought to our attention by Dr. Mosher in 1921.

The usual, and fortunately the majority of cases of acute mastoiditis, under proper care and operative procedures, run an uneventful course through their convalescence without evi-

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dence of septic complications, as shown by observation of the clinical charts in any of our large aural institutions. This fact is so striking, that after the very frequent reactionary temperature during the first twenty-four hours following operation, any subsequent rise in temperature is immediate cause for anxiety and thorough investigation.

Should evidence of complications occur, what are the problems to be considered? First, investigation of local conditions. An accidental folding of the auricle will not infrequently cause a rise in temperature of several degrees. This is especially true in small children. It is accompanied by distinct local discomfort. A slight rise in temperature accompanied by very severe headache is often accounted for by a very tight compressing bandage. The local reaction, and this is especially true in the acute fulminating type of mastoiditis, is accompanied by redness, extreme tenderness and edema of the tissues adjacent to the mastoid incision. This is usually readily relieved by warm moist packs. The presence of, or the previously existing furunculosis of the canal is occasionally observed. This is associated with pain and localized swelling and tenderness. Where iodoform gauze has been used, it is not infrequent to have a temperature of several degrees, often associated with chills and local discomfort. Examination of the wound reveals a very marked dermatitis, often indurating in type. Erysipelas is often associated with temperature and chill occurring twenty-four to forty-eight hours before any demonstrable local manifestations are present. Its evident development, as a rule, involves the auricle, the pre- and postauricular region, very frequently extending up over the cranium, and shows a definite outline which does not occur in iodoform poisoning. The presence of acute cervical adenitis, which is not at all infrequent in children, must also be seriously considered as a causative factor. Thorough physical examination of the patient must be made, bearing in mind the possibility of a pneumonia, and, in children, not infrequently the presence of a central pneumonia without demonstrable physical signs; acute endocarditis with or without demonstrable physical signs; any acute abdominal complication; the presence or absence of an acute nephritis. The most common causative factor of postoperative temperature in children is the presence of pyelitis. This latter is surprisingly frequent, not only in our public institutions but also in private practice, since infants and small children are very prone to develop a pyelitis in the presence of any septic focus. Postoperative cases are peculiarly prone to develop an acute pharyngeal or tonsillar infection, and it is not infrequent that a wave of this infection will apparently develop in a ward within 24 to

48 hours. The probability of the development of an acute otitis media of the other ear is often overlooked.

On the occurrence of unusual symptoms during the course of aural infection, a thorough and careful observation and examination having eliminated the above mentioned factors, the intracranial complications must be considered, —brain abscess, meningitis, infection of the sinuses. We will not consider brain abscess in this connection other than to mention the fact that an acute cerebellar abscess as a rule presupposes lateral sinus infection. The development of distinct suppurative meningeal symptoms is as a rule characteristic. It must be borne in mind, however, that many cases of sinus infection demonstrate clearly symptoms of serous meningitis during the very early stages, symptoms such as are usually designated as meningismus. It must also be remembered that in a large number of our fatal cases, the suppurative meningitis is secondary to or accompanied by infection of the cranial sinuses, especially of the superior and inferior petrosals, and we are unprepared to make a statement as to whether many of these cases are primarily sinus thrombosis or are secondary to the meningeal infection.

Contrary to the preconceived idea of many authors and of many otologists, I wish to impress upon you, that it is impossible to designate any definite cardinal symptoms which may be considered didactically as distinctive of lateral sinus infection or thrombosis. We must consider the symptoms present in an individual case as a symptom complex. Occasionally, we encounter a typical text-book case, but as you know, the symptomatology and pathological findings vary not only as to the personal equation of the individual, but also as to the prevailing cycle or epidemic occurring at the time.

We have observed definite cycles of infection occurring at intervals and demonstrating clinical and physical phenomena which are didactically different. We must be prepared to recognize these cycles and to deal with the prevailing type of infection and its sequelae. In the acute septic explosive type of sinus infection, we have a very sudden rise of temperature to the maximum, often to 105-106 degrees, with an equally rapid recession to normal or subnormal, occurring once, oftentimes 3 or 4 times during 24 hours, associated with distinct chill and sweating, a very evident picture of acute sepsis. This may continue indefinitely, or it may occur in periods of intervals of 2 to 3 days. This type is usually associated with distinct symptoms of meningeal irritation, as headache, slight stiffness of the neck, and evident involvement of the superficial reflexes. We have often observed a positive Koernig sign. The positive blood culture may or may not be pres-

ent, since apparently bacteremia varies decidedly in the individual case, being present on one culture and absent on the next; when present it may be considered to a certain degree confirmatory, when absent negative. The leucocytosis is usually increased to a more marked degree than in any other of the types.

The case most frequently overlooked, or not recognized during the early stages, is the one which shows a persistent irregularity of temperature, at no time rising more than 1 to 2 degrees, and showing no evidence of active sepsis. Patient complains of slight dull headache, inability to sleep at night, sensation of indefinable fullness and heaviness localized to the infected side, a marked lassitude, loss of appetite, and general malaise. Definite rigors are unusual. Close questioning will at times elicit a description of chilly sensations with slight flashes. Blood culture may or may not be positive—more often positive than in other types encountered. Leucocytosis seldom above 15,000.

Again, we have the case which shows an elevation of 2 to 3 degrees of temperature which does not remit to normal, but shows slight remissions and elevations from 100 degrees as a basis. In this type of case the temperature may, at intervals of several days, remit and remain normal for 24 hours to 10 days or more, and then recur. As in the previous type, the patient complains of unusual lassitude, inability to concentrate, dull indefinite sensations of heaviness localized to the infected side of the head. The leucocyte count as a rule varies from 8,000 to 12,000. Blood culture may or may not be positive. The blood culture, when positive, is a fairly definite indication that there is a septic focus, and, other foci being excluded, must be considered as a definite indication for operative interference.

Again, we have the afebrile type. In 1919, we reported 11 cases of this type occurring in a series of 73 consecutive cases. Numerous cases have since been reported by others. From our observation, these all occurred in cases of long standing, and were discovered only during the operation on the mastoid, and, as a rule, associated with a perisinus abscess. This condition occurs much more frequently than we have thought, and as I will show later, many of the cases of perisinus abscess demonstrate more or less obliteration of the lateral sinus. One of the most constant objective symptoms which we have found has been edema and infiltration with tenderness on deep pressure over the area drained by the emissary vein. This is quite distinct and readily differentiated from mastoid edema and tenderness, and, per se, never extends over the posterior border of the mastoid. This same symptom or sign is occasionally found just below and posterior to the mas-

toid tip, due to blocking of the posterior condylar vein. This latter is not constant. This edema and tenderness must be differentiated from acute or subacute adenitis. Tenderness along the jugular vein we have never been able to demonstrate to be, when present, due to other than infection of the cervical glands. The refusal of healthy granulation tissue to develop may lead one to suspect an involvement of the sinus.

Optic neuritis, or choked disc, we have found to be present in about 10% of the cases. We have never been able to demonstrate that pressure over the patent sinus, or both simultaneously, has made an appreciable difference in the eyeground. Anatomically, the type of mastoid apparently plays no important role.

After reviewing the well known symptoms with which you are cognizant, I am afraid that we will feel much as Dr. James Babbitt felt, when in a recent address, having carefully summed up the symptomatology, he inserted the following paragraph:

A. "Unfortunately none of the cases in the writer's recent experience has conformed in any material degree to this outline."

B. "Patient seems more ill than could actually be accounted for by associated or previous mastoid symptoms."

Dr. Babbitt has certainly uttered a truism. For up to within recently, we have had no definite test other than actual investigation of the sinus lumen itself.

As the result of several months' investigation, in conjunction with Dr. James B. Ayer, of the dynamics of the cerebro-spinal fluid, we feel justified in presenting for your consideration a relatively new test in the diagnosis of lateral sinus thrombosis. This test is based upon the fact that increased intracranial pressure is normally propagated throughout the cerebrospinal fluid system and may be measured by a manometer employed in connection with lumbar puncture. Compression of the internal jugular veins causes increased intracranial pressure with immediate rise in spinal fluid pressure.

It is now generally considered that absence of rise in fluid pressure on jugular compression (positive Queckenstedt's) indicates spinal subarachnoid block, a most important and early sign in spinal cord tumor. More recently, it has been shown that block may also occur and be detected in a similar manner in the presence of tumor of the cerebellar fossa².

In both of these conditions, the evidence on which diagnosis of block rests is absence of rise in pressure below the level of obstruction, the increased intracranial pressure being assumed in single puncture below, or proved by two punctures, one above and one below the level of obstruction³.

It may be safely said that the criteria on which these tests depend and the results of the tests have been for the most part dependable. So much so, in fact, that the effect of jugular compression on spinal fluid pressure now forms one of the routine tests in diagnostic lumbar puncture.

While the criterion on which a diagnosis of sinus thrombosis is based is the same as that of subarachnoid block, namely, absence of rise in pressure in the spinal fluid manometer, it will be seen that the mechanism by which this is shown is quite different. Instead of an increased head of fluid which cannot be transmitted because of obstruction, there is here no elevation of pressure at its source, because of venous obliteration.

Also, we are here concerned with careful comparison of the effect of pressure on each vein separately, not merely with the effect of simultaneous compression of both internal jugular veins, as in the diagnosis of cord tumor.

SINUS THROMBOSIS TEST

The test for sinus thrombosis, as we have used it, is as follows: With the patient in the lateral position, lumbar puncture is performed, and the fluid is allowed to run into a glass manometer of 2 mm. bore. The initial pressure reading is noted; also the presence of pulse and respiratory oscillations as evidence of patency of the manometric system. Now, without in any way disturbing the patient, an assistant gently presses on one side of the neck between the larynx and the sternocleidomastoid muscle until he feels a strong carotid arterial pulsation. During the compression, the operator watches the rapidity of rise of the fluid column in the manometer, the promptness of its beginning and the full height to which it attains, and, on release of jugular compression, the rapidity of drop in pressure. The procedure is now repeated on the opposite side of the neck, and then, for comparison, both sides of the neck are pressed simultaneously.

In a typical case of lateral sinus thrombosis, there is a prompt and rapid rise in fluid pressure to twice or three times the initial reading when the internal jugular vein draining the normal sinus is compressed. This pressure rise is maximal, being equivalent to the pressure attained when both jugular veins are compressed.

Pressure over the vein draining the thrombosed lateral sinus causes either no rise or more commonly, a slow rise of only from 10 to 20 mm. in the manometer.

These findings are characteristic of complete obliteration of the sinus. Partial obstruction from mural thrombosis naturally gives less striking results, yet is of value when correlated with the clinical findings.

We may consider some of the pitfalls of the technic as encountered in the study of 84 cases:

1. Incomplete compression of the jugular vein as the result of faulty technic in applying compression accurately, as a result of obesity, tumors, cervical adenitis, or phlegma.

2. Absence of rise in fluid pressure or very slight rise is occasionally noted in patients with no obstruction either in venous or in subarachnoid fluid systems when the cerebrospinal fluid is under low tension. This can easily be proven in a given case by injecting from 10 to 20 c.c. of physiologic sodium chlorid solution, whereupon dynamic tests will appear normal.

3. An abnormal rise in fluid pressure may result from carelessness in performing the test, leading to extraneous acts on the part of the patient. If the patient coughs, holds his breath, grunts, or even moves the head or body, a prompt rise in pressure will be noted under normal or abnormal conditions, thus vitiating any record.

4. Normal difference on the two sides. The foregoing pitfalls concern bilateral as well as unilateral venous compression. A group of unselected patients in the neurologic clinic were examined with a view to determining the uniformity in response to jugular compression on the two sides. The following conclusions are justified from this study: (a) There is often a marked difference in the height of the pressure reading following compression of each internal jugular vein separately. However, a difference of over 50 mm. is unusual and over 100 mm. exceptional. (b) Given a normal initial spinal fluid pressure (150 mm.) the rise on jugular compression of one side usually will be ample, seldom less than 50 mm., more likely over 100 mm. (c) The rise in fluid pressure appears to be somewhat less when the vein on the dependent side is compressed. It is likely that this is an error in technic due to difficulty in reaching this vein rather than an inherent difference in physiology.

5. Anatomic variation in the size of the lateral sinuses must be admitted, although a demonstrable difference in the size of the two lateral sinuses is unusual. This difference is occasionally observed, and in our experience with this test one example of such discrepancy occurred. We must, therefore, admit a certain irregularity in the anatomic disposition of the tributaries of the internal jugular vein, variations of the facial vein being of greatest significance in this test. It is probable that the slight rise frequently observed on compression of the jugular vein on the side of complete sinus thrombosis is to be explained by coincident compression causing stasis in the ophthalmic venous system.

DANGERS

The possibility of two known dangers must be admitted in the use of this test. We refer to (1) sudden death from the presence of sub-tentorial abscess or tumor following lumbar puncture, and (2) the precipitation of acute meningitis.

The first danger may almost be eliminated by a careful preliminary examination of the patient. If the neurologic examination suggests the presence of abscess or tumor, but especially if choked discs are found, the well known danger of medullary paralysis following lumbar puncture must be entertained. In such patients the spinal fluid tests should not be attempted.

The second possible danger relates to the liberation of organisms from an area of localized infection or from the blood stream. The former appears to us to be unlikely unless large amounts of fluids are withdrawn. But the latter danger rests on experimental evidence in which it was shown that in the presence of blood infection, passage of organisms from vessels to meninges may be facilitated by withdrawal of cerebrospinal fluid, by cerebral venous congestion¹. Although recognizing this as a biologic principle, we have so far failed to note this serious coincidence clinically. Further, we believe that this danger is not great, because we seldom have present in man the setting required for the experimental production of meningitis, namely, septicemia with a sufficient number of organisms or of proper virulence; nor do we reduce fluid pressure so greatly or congest cerebral vessels so long as in the experiments in which meningitis was precipitated from septicemia.

We feel justified, after careful analysis of these cases, in stating that a definite dependable preoperative diagnosis of complete lateral sinus thrombosis, positive or negative, may be made, and that confirmatory data of mural thrombosis is often demonstrable.

We have outlined the following classifications:

1. Complete obstruction—obliteration of the lumen of the lateral sinus or the jugular bulb, or of both.
2. Incomplete obstruction—mural thrombosis.
3. Negative—no obstruction to venous outflow.

CONCLUSIONS

When, during the course of an aural infection, there is evidence of sepsis, infection of the lateral sinus or jugular bulb must be considered. Evident sepsis being present, a careful differential diagnosis having excluded all other sources, ligation of the jugular and exploration of the lateral sinus is indicated.

When obstruction of lateral sinus, jugular bulb, or internal jugular vein occurs, block may be demonstrated by dynamic studies of the cerebrospinal fluid.

The manometric studies on the fluid have proved reliable in the case of complete block and highly suggestive in the case of incomplete block, not only in determining the presence of thrombosis but also as criteria as to which side is involved.

Absence of block as determined by spinal fluid tests is also of value in the differential diagnosis of sinus thrombosis.

The test has proved of special value in cases presenting double mastoiditis developing symptoms of lateral sinus thrombosis.

While theoretic dangers must be admitted in carrying out this procedure, in 84 cases we have not seen evidence of ill effect from the technic.

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A CORN KERNEL IN THE BRONCHUS

BY LYMAN RICHARDS, M.D.

The corn kernel shown in the accompanying drawing was accidentally aspirated into the lung of J.C., age 3½, while she was assisting in feeding the chickens. Immediate symptoms of moderate choking and wheezing resulted in the calling of a doctor who wisely transferred the child to a hospital for X-ray and observation. During the next three days the only evident symptoms were a slight cough and tracheal

wheeze without dyspnea or cyanosis. Physical examination of the chest revealed some diminution in the respiratory murmur on the right but no râles or evidence of emphysema. X-ray examination showed nothing conclusive. The temperature had gradually risen until, when I saw the patient in consultation the third day, it was 105 degrees. Preparations were made for bronchoscopy which was performed

without anesthesia. A 4 mm. tube was inserted into the trachea and the corn kernel was seen immediately, occupying the lumen of the right main bronchus. A good deal of mucopurulent secretion made it difficult to apply forceps under direct vision with the result that an insecure grasp allowed the foreign body to be stripped off at the glottis. A second expo-



Corn kernel removed from left bronchus.

sure of the larynx revealed the corn kernel bobbing up and down in the trachea and repeatedly striking against the under surface of the vocal cords. The bronchoscope was again inserted and the foreign body chased to the left bronchus where further efforts to grasp it were unsuccessful and were discontinued. Four hours later signs of impending laryngeal obstruction became evident and a tracheotomy was performed under local anesthesia. It was felt wiser to postpone further efforts to remove the corn until the child's general condition should have improved. A fairly comfortable night and morning were passed but at 2 P. M. a gradually increasing supra-sternal and epigastric retraction were noticed. The tracheotomy tube was removed entirely and the opening in the trachea enlarged, with definite improvement to respiration. The patient was comfortable until 7 P. M. when she suddenly developed marked symptoms of respiratory obstruction found to be due to the accumulation in the lower trachea of thick tenacious mucopurulent plugs which the child was unable to cough up.

A similar condition has been reported by Clerf of Philadelphia in a case requiring 17 bronchoscopies to remove obstructing masses and maintain a patent air way. In the present instance these accumulations were removed by forceps and suction reaching well down into the trachea, together with blunt probing to loosen them from the trachea walls, after which they could be coughed up through the tracheotomy opening. Chest signs at this time were those of a complete blockage of the left lung with obstructive emphysema evidenced by absence of breath sounds and hyper-resonance. The temperature was 102 degrees and respiration rapid though free as long as the thick dry secretions were repeatedly removed. After some deliberation as to whether the best chance lay in a quick and if possible successful removal of the corn or in further delay to await recuperation it was decided to perform another bronchoscopy. A 4 mm. bronchoscope was inserted through the tracheotomy wound, the foreign body quickly located, secretions removed, forceps applied, and the corn kernel withdrawn without further difficulty. The left lung immediately resumed its function, air entering and leaving it without any evident obstruction. During the next twenty-four hours the same accumulation of dry, gummy crusts and secretions required removal about every four hours. The coughing reflex was fortunately good and nothing in the way of a sedative was given to obtund it so that by loosening, suction, and coughing, the obstructing masses were readily removed. Hydriodic acid and ipecac were of great help in promoting and thinning the bronchial secretions which soon became normal. The tracheotomy tube was replaced though frequently changed and cleaned since it seems that one of the causes of the crusting was the large amount of unmoistened air received by the bronchi through the widely open trachea. The temperature returned to normal. Smaller tracheotomy tubes were inserted and finally omitted altogether and the wound allowed to close, its edges being held in approximation by adhesive strips. No voice injury is apparent and respiration is entirely unobstructed.

NEW ENGLAND SURGICAL SOCIETY

MASSIVE ATELECTASIS OF THE LUNG AS A SURGICAL COMPLICATION

BY ERNEST L. HUNT, M.D., F.A.C.S.

DEFINITION

TOTAL or partial collapse of the lung occurring particularly after operations and injuries, and characterized by dyspnoea, dulness over the involved area and marked displacement of the heart and mediastinal contents to the affected side.

RITVO.

INTRODUCTION

My interest in acute massive atelectasis was largely academic until recently, while going through the literature seeking enlightenment on the general subject of operative fatalities, I came upon the very stimulating papers of W. J. M. Scott¹, formerly of the Peter Bent

Brigham Hospital, now of Lakeside in Cleveland, and of W. E. Lee² of Philadelphia. The former appeared in *Archives of Surgery* of January and the latter in *Annals of Surgery* for April, 1924. A second article by Lee in association with Chevalier Jackson³ has just appeared in September *Annals*, although presented at the meeting of the American Surgical Society May 5 of this year.

As these papers are probably fresh in the minds of most of you, and as they cover the subject with great thoroughness I should hardly wish to bring it up on this occasion had I not encountered two very interesting examples of the condition, one of which presents a clinical sequence of events having a significant bearing upon the relation of massive collapse to certain other conditions.

If further apology is needed for reporting cases illustrative of a condition so lately coming into notice I may add a hope that the account may interest this group of surgeons in study of the lungs of all their cases in relation to this lesion, in order that our knowledge of its incidence and causation may become more definite, and especially that we may more effectively avoid some of the pitfalls leading to operative fatalities.

In most cases described except those following war wounds, which are not here considered, this type of collapse has occurred suddenly and unexpectedly as a complication following an abdominal operation, in nearly all within the first 48 hours. Since Pasteur⁴,⁵ introduced the term in 1908 it has generally been referred to as post-operative acute massive collapse of the lung and is defined by Sir John Rose-Bradford¹² as an unusual condition in which the lung becomes airless to a greater or less degree and therefore useless for respiratory purposes without the presence of any gross lesion such as bronchial obstruction, pleural effusion, etc., interfering with the free entry of air.

It is an active process as distinguished from the passive processes resulting from pneumothorax, effusion, or bronchial obstruction by foreign bodies.

Scott reported four cases and collected sixty from the literature. Fourteen of the latter were reported between 1910 and 1914, the remainder from 1921 to 1924 the date of his article. Lee and Jackson in their recent communication add nine more to this list and make two valuable contributions to our knowledge by autopsy findings in two fatal cases and very suggestive observations by means of the bronchoscope upon two cases which recovered. In addition, Dr. Jackson adds some very pertinent observations upon the mechanism of collapse following bronchial occlusion by foreign bodies

as studied by bronchoscopy and by a special technique of radiography.

The availability of these papers with their complete reviews of the literature makes further review superfluous on my part, but emphasizes the importance of the condition both to the clinician and to the investigator.

Scott's analysis of forty cases shows the condition complicating operations according to the following tabulation:

Operations	Cases
Appendectomy, clean	9
Appendectomy, drained	8
Appendectomy with oöphorectomy	1
Herniorrhaphy, inguinal, single	9
Herniorrhaphy, inguinal, bilateral	1
Herniorrhaphy, inguinal, strangulated	1
Herniorrhaphy, ventral	2
Cholecystectomy	2
Hysterectomy	1
Salpingectomy	1
Laparotomy	1
Laparotomy for peritonitis	1
Colectomy	1
Hemorrhoidectomy	1
Inguinal abscess	1
	40

In this series the right lung was the seat of the trouble in 31 and the left in 9 cases. Ether was used alone in 9, gas-ether in 6, gas-ether-chloroform in 3, gas-oxygen in 2, chloroform 3, spinal 1, anesthetic not recorded in 16.

There were no fatalities, the average period from the onset of symptoms to clearing up of the lung being about 10 days.

Lee and Jackson report four cases in considerable detail, from the protocols of which I abstract the following summaries:

CASE 1. Strangulated left femoral hernia, local anesthesia, symptoms of massive collapse on third post-operative day. Death on fifth. Autopsy found collapse of lower right lobe with purulent pneumonia of the two upper lobes. Plugs of mucus were found in the bronchi to the collapsed lobe.

CASE 2. Male, 12. Appendix abscess, drained, anesthetic not stated, comfortable for 48 hours but kept lying on the right side to facilitate drainage—sudden collapse of right middle and lower lobes occurred on the third post-operative day. Bronchoscopy was done removing thick mucus. Repeated 4 days later. Relief of symptoms followed by clearing of lung within 48 hours.

CASE 3. Male, 14. Appendectomy with drainage of abscess, nitrous oxide anesthesia. Collapse of whole right lung on fifth post operative day. Bronchoscopy not done. Recovery gradual requiring 42 days.

CASE 4. Female, colored, 18. Caesarian Section, anesthetic not stated. Acute collapse

of lung with death on third day. Autopsy found complete atelectasis of left lower lobe, partial of the right. Sticky mucus was found in the entire bronchial tree leading to the left lower lobe.

THEORIES AS TO CAUSATION

In comparing the opinions of the several contributors to this subject as to its cause one finds considerable similarity but with one or another possible factor emphasized according to the point of view created by the author's experience with his personal cases.

Pasteur first studied massive collapse in relation to post-diphtheritic paralysis of the diaphragm and his further observations of post-operative cases were naturally influenced by the earlier and convincing observation of at least one definite sequence of cause and effect. He, therefore, attributed an important role to reflex paralysis of the diaphragm and intercostal muscles originating from the traumatism at the operative field and tersely remarked that his five post-operative cases were "clear examples of active lobar collapse from reflex inhibition of the diaphragm." He likens abdominal section to a "hit below the belt" because the patient is always "winded" by it more or less. Therefore, in his opinion, deficiency of the inspiratory power however induced, is the direct cause of the collapse of the lung.

As a result of the bronchoscopic and post-mortem findings Lee is impressed by the evidence that mucoid obstruction of the bronchi plays an important part in the causation of the collapse by preventing ingress of air, in a manner analogous to the collapse observed in obstruction by foreign bodies. The rapid convalescence following removal of some of the mucus in his Case 2 should, however, be considered with the rapid recovery unaided by bronchoscopy in Seringer's Case 4 in which complete collapse of the right lung occurred on the 13th day following an operation for right inguinal hernia and sudden spontaneous relief occurred on the 18th day. It is recorded that "about 3 a. m. after a distressful night he became markedly better."

"X-rays on the 16th day showed density of the entire right lung which on the 18th had almost entirely cleared up."

Raising of mucus co-incident with the improvement is not mentioned and presumably did not occur, for Seringer does not ignore the possibility of mucus as a factor and later mentions that mucoid sputum occurred early in all his cases. He argues in favor of reflex spasm of the bronchioles and cites experimental evidence of vagus control of the smooth muscle elements which seem capable of being thrown into spasm by impulses originating in the nasal passages or abdominal viscera.

Rose-Bradford¹², whose cases were of war injuries, also expresses belief that a nerve reflex is necessarily implied in the cases where collapse has followed trauma to the opposite chest wall, or abdomen or the extremities.

Limitation of the respiratory movements of one side of the chest either by posture or reflex "splinting" of the abdominal muscles and diaphragm to protect inflammatory or traumatized areas (pleurisy, peritonitis, etc.) with consequent collection of mucus in the passages followed by absorption of air from the relatively inactive lung as originally conceived by Pasteur has also been advanced by Elliott and Dingley⁸ as an adequate explanation of the phenomenon. Lee and Jackson feel that their findings harmonize with this theory and very reasonably call attention as an additional factor to abolition of the normal cough reflex by voluntary repression on account of abdominal pain or by the free use of morphine. Scott dismisses bronchiolar spasm as it has generally been conceded to cause emphysema rather than collapse. He considers localized oedema of the bronchial mucosa analogous to allergic reactions observed in other parts of the body as one possibility.

INCIDENCE AND CLINICAL MANIFESTATIONS

Pasteur's original estimate of the incidence of massive collapse was 8% of all post-operative pulmonary complications. Subsequent writers express a belief that it is not only more common than Pasteur found but that *partial* collapse is an initial or accompanying lesion in many of the other complications such as broncho-pneumonia, empyema, etc. In the fatal cases it has been found that the patients did not die of collapse per se but of the complications. The condition occurs as a clinical syndrome and when uncomplicated is distinctive and readily recognized. Usually within 48 hours after operation the patient shows evidence of an acute pulmonary crisis. He lies on or inclined to one side, his color is dusky or cyanotic, respirations are rapid with elevated temperature and pulse. Turning on the opposite side, slight exertion or coughing brings on immediate dyspnoea and distress. Pneumonia is usually diagnosed but the temperature curve is not in keeping with the severity of the respiratory symptoms nor is there the toxic state which might be expected.

Cough and pain are fairly constant *early* symptoms and bloody sputum may occur at the beginning but is not usually conspicuous until complications develop. Closer observation will reveal that there is dulness over the affected side and the heart is displaced *toward the dulness*. The chest wall is both relatively immobile and often decidedly flattened while the op-

posite side shows relatively increased excursion with widening of intercostal spaces. The unaffected side shows hyper-resonance which encroaches upon the usual position of heart dulness.

The physical signs of dulness, heart displaced toward the dulness, immobility and flattening of the affected side are practically constant and in association are *pathognomonic*. Other important signs occur but are variable. Generally the dulness is accompanied by distant breath sounds and absent tactile fremitus. The breath sounds when heard are bronchial in character and with forced breathing are loudly tubular. Whispered pectoriloquy is present. Râles seem most variable of all signs and apparently depend upon the areas of lung not actually collapsed and the amount of secretion in the bronchi.

With clearing of the lung, resonance and broncho-vesicular breathing return, generally by segments, which gradually coalesce accompanied by amelioration of symptoms and return of the cardiac dulness toward its former position.

The X-ray is the most useful method of examination because it shows so much with so little disturbance of the patient. The lung shadow is dense with often a thinning toward the ribs. The trachea and heart are drawn toward the side showing the density and the diaphragm, if it can be seen, is about a space higher than normal. Fluoroscopy is not often possible because of the patient's distress and the requirements of post-operative care.

The temperature curve does not run high. Lysis begins almost immediately and the temperature is apt to be normal considerably in advance of complete clearing as shown by the physical signs. A few cases terminate by crisis. The blood picture is not characteristic.

CASE 1. W., K., male, 21, was admitted to Worcester City Hospital at 10.35 A. M., August 27, 1925. He was in great pain and quite prostrated with rigid and very tender abdomen. While driving his truck about 9.00 A. M. had been seized by agonizing epigastric pain which "doubled him up." He was taken seven miles to the office of Dr. J. F. Curran, who immediately transferred him to the hospital. His past history was negative except that for the past two years had been subject to infrequent attacks of discomfort one or two hours after meals with belching of gas and sour eructations. A brother had a similar attack one year ago for which he was operated upon and a perforated duodenal ulcer with general peritonitis found and successfully treated.

PHYSICAL EXAMINATION

Pulse 66, temp. 98°, respiration 22. Face flushed, anxious and perspiring. Chest

well developed, respiration shallow but expansion equal and regular. No cough or cyanosis. Lungs clear and resonant throughout. Normal fremitus and percussion note. Breathing vesicular throughout, no râles. Heart not enlarged to percussion. Rt. border at sternal margin, left border 8 cm. to left of median line. Apex impulse not seen or felt. Sounds regular, good quality. No murmurs or thrills. $P_2=A_2$ neither accentuated. Pulses regular, good volume and tension, equal and synchronous. White count 16,600, Hemoglobin 90%. Urine normal, Blood pressure 112/92. Morphine gr. $\frac{1}{4}$ was injected at 10:22, he was put to bed, warmed up and prepared for operation, coming to the table at 1:25, the delay being unavoidable because all operating rooms were in service.

Operation. Ether. Dr. Hunt.

An upper rt. rectus incision was made, a thick glairy, greyish-yellow fluid escaped in considerable quantity and was soon found to be squirting from a slit-like perforation on the ant. wall of the first portion of the duodenum. The wall of the duodenum was thickened about the perforation for an area 2 cm. in diameter. Closure was effected by a double row of catgut sutures considerable pull on the retractors being necessary in order to reach the lesion. Cigaret drains were inserted to the locality of the perforation and to Morrison's pouch; the wound closed down to the drain, and the patient sent to the ward with instructions to the nurse to keep him on the rt. side, hoping thereby to facilitate drainage from Morrison's pouch where the fluid had tended to accumulate. Op. completed at 2:25.

Aug. 28. Pt. lying on rt. side, fairly comfortable, keeping down small quantities of water.

Aug. 29. Still on rt. side. On ward rounds it was noticed that his respirations were rapid and face dusky. Examination of his back without changing his position noted dulness and bronchial breathing below the shoulder blade and as far into the axilla as the stethoscope would slide. A diag. of lobar pneumonia was made.

Aug. 29. During the night his temp. reached 103, pulse 125, resp. 36. Morphine was given twice because of pain in abdomen and chest. There was an occasional distressing cough, usually excited by an attempt to change position. A small amount of yellowish tenacious sputum was coughed up. Still cyanotic.

Aug. 30. Bowels moved freely after an enema. Patient more comfortable and able to lie on his back for short periods. Careful physical examination of chest noted the following points:—

"There is marked restriction of respiratory

excursion of the chest wall on the rt. with compensating increase on the left. There is distinct flattening of the rt. pectoral area as compared with the other side. The rt. chest is everywhere dull to percussion, tactile fremitus is absent. The precordial and liver dullness merges with the lung dullness but the left border of cardiac dullness is but 5 cm. from median line. There is distant bronchial breathing everywhere especially if patient makes an effort to breathe deeply. No râles are heard. There is bronchophony and whispered pectoriloquy though all auscultatory sounds are more distant in the lower axilla than in front and back. The heart sounds are very distinct between the rt. margin of the sternum and the nipple line. Position of lower border of liver not observed. Diagnosis changed to massive collapse of the rt. lung."

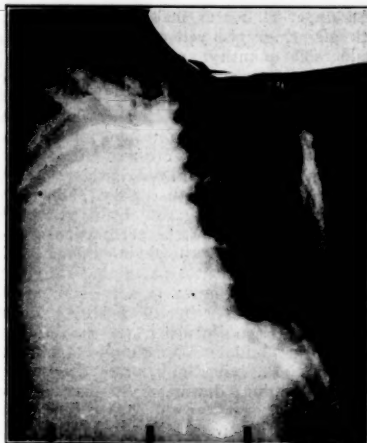


FIG. 1. Roentgenogram of Case 1, Aug. 31, 1925. Complete density of right lung. Heart shadow and trachea pulled to right.

Aug. 31. An X-ray obtained by means of the portable outfit showed complete density of the whole rt. side of the chest with displacement of the trachea and heart to the right. Patient more comfortable but dyspnoea resulted if he was kept more than a few minutes on his back. The cough was dry and non-productive. Abdominal condition satisfactory. Full liquid diet allowed.

Sept. 2. X-ray showed somewhat greater displacement of the heart and trachea to right. There was less density toward the chest wall and the rt. edge of the heart shadow was distinct. The arch of the rt. side of the diaphragm was shown at level of the third interspace.

Sept. 3. Marked general improvement.

with return of normal breath sounds above third rib. Patient able to move himself freely in bed. Both drains removed.



FIG. 2. Sept. 1. Similar to Fig. 1 but pulling of heart and trachea to right more definitely shown.

Sept. 8. There has been progressive clearing of chest with advance of normal breath sounds toward the axilla and base. There was

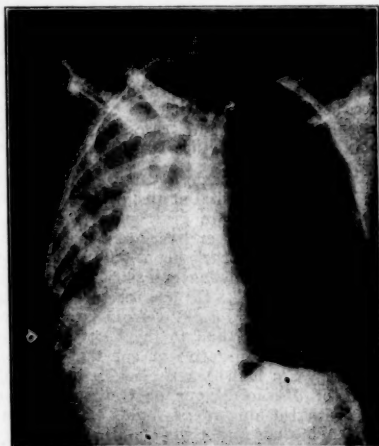


FIG. 3. Roentgenogram, Case 1, Sept. 2, 1925. Heart shadow less displaced. Lung clearing in patches. Trachea still slants to right.

still noticeable difference in the respiratory excursion of the chest walls on the two sides. There was no discomfort or cough. Left border

of cardiac dullness 6.4 cm. to left of median line.

Sept. 10. Out of bed.

Sept. 15. Discharged, symptom free except for slight drainage from upper end of wound.

Sept. 28. Returned for examination:

Radiogram showed complete restoration of heart

and trachea to normal position with normal permeability of lung. Patient gaining strength and weight. Wound not quite healed.

CASE 2. J. W., male, age 59, Swede, merchant.

Entrance note: Admitted to Worcester City Hospital Sept. 8, 1925, conscious and rational but weak and suffering much from severe abdominal pain in rt. upper quadrant and mid epigastrium, extending into chest, back and rt. shoulder. Pulse 94, R. 20. Temp. 98, B. P. 135/85, white blood count 12,200. Urine contains bile, slightest possible trace of albumin and rare hyalin casts. Sclerae are slightly icteric. Abdomen very tense, especially in upper half. There is a very acute tenderness below the rt. rib margin extending to mid line at epigastrium. A distinct rounded mass can be felt 3 inches below the rt. costal border.

P. I. Pt. has been acutely ill at home for two days, having been suddenly taken with rt. upper quadrant pain and vomiting. He has suffered continuously since with frequent knife-like exacerbations of the pain and has been unable to obtain a bowel movement. His physician being unable to relieve by medication and noticing that he was jaundiced, referred him for operation. No cough or sputum.

P. II. Has long been accustomed to use of strong liquors on week ends. Never had typhoid or pneumonia but has been subject to



FIG. 4. Roentgenogram of Case I, Sept. 28, 1925. Complete clearing of lung, heart in normal position.

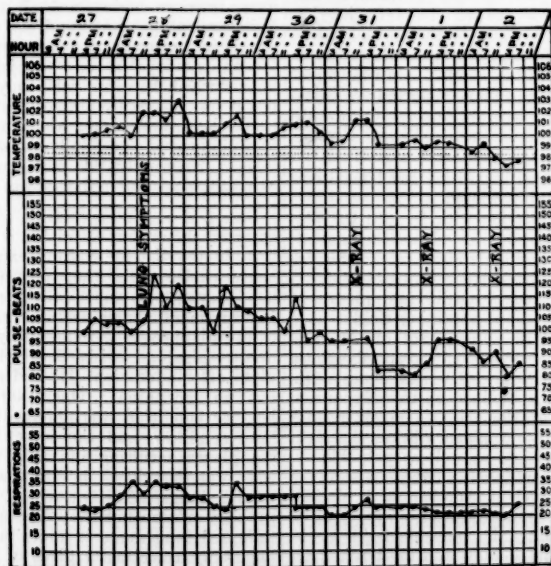


FIG. 5. Temperature Chart of Case I.

frequent colds, headaches, and sore throat. Has had considerable indigestion and pain under ribs on the rt. often in attacks lasting two or three days which he considered to be pleurisy because the pain extended through to back and shoulder. Has never been jaundiced before. No kidney trouble. About July 1 strained back and side of chest at his work which was followed by a week's illness characterized by pain in the rt. chest and back which he thinks was pleurisy; his doctor said there were no ribs broken.

P. Ex. No note was made of the chest findings as of entrance. Sept. 9 he lies inclined toward the rt., face flushed and dusky with marked limitation of excursion on rt. side of chest. There is marked dullness with bronchial breathing over whole rt. chest below third rib while the left side is hyper-resonant; the apex beat cannot be felt but the left border of cardiac dullness is fully an inch inside left nipple line. There is marked tenderness in upper rt. quadrant with a palpable mass as above described. Temp. 101.8. Pulse 120. Resp. 28.

Sept. 10. X-ray of chest by Dr. P. H. Cook reported thus—"Density over lower 2/3 of rt. chest most pronounced at base where it obscures costo-phrenic sulcus. Heart and mediastinal contents pulled to right. Massive atelectasis."

Sept. 15. Abdominal symptoms better. Chest condition not improved. When he lies flat on his back or toward the left he has marked dyspnoea and has to change to rt. side after a few moments. Breath sounds are more distant, tactile fremitus absent. Dullness about as before. X-ray today reported: "Thickened pleura at rt. base with fluid to seventh rib posteriorly. Displacement of heart slight." P. H. C.

Sept. 16. Urine still positive for bile. Stools have never been clay-colored.

Sept. 17. Consultation with Drs. R. P. Watkins and A. W. Marsh who advised against attempting to drain gall bladder under local anesthesia in face of apparent improvement.

Sept. 19. Inserted a needle into pleura at eighth space rt. without obtaining fluid.

Sept. 20. Pain in upper right quadrant is his chief subjective symptom except dyspnoea on change of position. He lies almost constantly on his back inclined to rt. Expansion of the left side of the chest is much greater than of the rt. A prominence below the right costal border is visible as well as palpable.

Sept. 21. X-ray taken sitting up shows a suggestive fluid-level. Another with patient lying on his side shows diffusion of the shadow and is best explained by movable fluid in the pleura. The heart shadow and the trachea are back nearly to normal position although the

heart apex is tilted upward somewhat. The temperature curve has been oscillating in a manner suggestive of pus.

Sept. 24. Inserted a needle one space higher than on the 19th and withdrew 17 oz. of creamy pus.

Sept. 27. Repeated the aspiration, removing 8 oz. more of pus. This was followed by a chill of moderate severity.

Sept. 29. Under local anesthesia made a slit in the seventh intercostal space and inserted a self-retaining catheter, closing the incision lightly down to the tube. Instructed nurse to aspirate about every two hours until no pus could be obtained. A severe chill followed this operation.

Sept. 30. X-ray shows end of catheter in a cavity beneath the diaphragm from which the pus apparently came. No chill today. Diagnosis revised to subdiaphragmatic abscess. Lung shadow still dense. Heart shadow more nearly in its normal position.

DISCUSSION OF THE CASES

Case 1 is typical. Here we had the conditions which fulfill the essentials of Pasteur's theory of causation. An acute peritonitis from spilling of quantities of chyme through the perforation resulting in a board-like spasm of abdominal muscles and doubtless also of the diaphragm, followed by the trauma of operation then a fixed posture on the rt. side to facilitate drainage maintained all night. In addition morphine, ether and the abdominal pain restricted the cough reflex. Questioned lately the patient says he was annoyed by tenacious mucus which he could raise only with difficulty but it was not expectorated in any quantity.

His condition seemed alarming for two days then improved gradually without complications. Seemingly this case supports the idea of mechanical and reflex causes of the trouble.

Case 2 if our interpretation of the findings is accepted shows that operation is not a necessary item in the list of exciting causes. Here an acute cholecystitis (not proven by operation but by symptoms and local signs) likewise causing spasm of abdominal muscles and probably of the diaphragm is followed by a similar sudden respiratory crisis developing during the night after admission. He had received veronal but no morphine. Operation for the gall-bladder condition was deferred in fear of the lung condition and the infection extended to the pleura resulting in rapid development of what was thought to be empyema under the retracted lung. This presented of itself a nice problem of treatment. The presence of the collapsed lung made it undesirable to open the pleura by resecting a piece of rib and inserting tubes in the old way so closed catheter as-

piration was resorted to with apparent good result in fractional evacuations of the fluid.

X-ray on the following day revealed the end of the catheter to be in a cavity under the diaphragm while the lung shadow remained dense. Here, then, is a case in which massive atelectasis followed an upper right quadrant suppurative process occurring, fortunately before operation had been attempted, but in which the factors of reflex spasm of abdominal muscles and diaphragm were present.

Treatment. Excepting the suggestive results obtained in Lee's cases by bronchoscopy there seems to be no method of directly attacking the condition. Scott's experiments with atropine, adrenalin and morphine were not productive of evident benefit. Symptomatic and supportive measures are called for. The iodides and use of blow bottles probably have their place. Complications are to be handled as they particularly require but the evacuation of effusions either serous or purulent must be done with due consideration of the displaced heart and mediastinal structures as well as the possible disadvantage of pneumothorax with the lung already collapsed. At present our efforts must be toward prophylaxis and the points which immediately suggest themselves are—

(1) A complete and adequate chest examination before operation or anesthesia, with careful note and record of size and position of the heart, shape, symmetry and expansion of the chest walls, action of the diaphragm, and any departure from normal ascertained by auscultation and percussion of the lungs. Pre-operative X-rays of the chest should be had whenever possible.

(2) Avoidance of protracted postures which restrict respiratory action. A practical rule would be to order hourly change of posture sufficient to successively bring all parts of the chest into unrestricted action.

(3) Safeguard the cough reflex by limiting morphine both before and after operation to the minimum necessary for the comfort of the patient. Train anesthetists to administer and ourselves to operate under the lightest anesthesia consistent with safe technique. Use the less irritating anesthetics and local wherever the purpose and adequacy of operation will not be vitiated thereby.

(4) Minimize operative trauma.

Conclusion: Inasmuch as it is conservatively estimated that one operative case in every 185 will die of a lung complication and as the studies of post-operative atelectasis indicate it to be a precursor of some of the more serious lesions it behooves us to be on the watch for it and to exercise all precautions to avoid, and when encountered, to study it with minute care.

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DISCUSSION

DR. WYMAN WHITTEMORE, Boston: I am very glad Dr. Hunt used the term "atelectasis of the lung" rather than "massive collapse," because, according to my experience, this is atelectasis. Collapse can only be brought about by pressure from the outside; that is, air in the chest or fluid in the chest.

There are two points of interest. They are the etiology and the treatment. The etiology—according to my views—is due to one of two things: First, to some interference with the respiratory movement, and, second, to accumulation of mucus in the bronchial tree. The interference with normal respiration may be very slight, may be due to the position the patient is placed in, or it may be due to pain after abdominal operations, particularly after operations in the upper part of the abdomen, this being brought about by either voluntary or reflex inhibition so that the patient does not breathe the way he normally would. Now as this takes place, there is an accumulation of normal mucus in the bronchial tree which eventually acts as a plug to the bronchus. This acts as a complete plug so that air neither enters the lung nor goes out; and the air that already is in the lobe of the lung is gradually absorbed, so that a true atelectasis takes place.

As for treatment, I don't think there is any treatment directed toward this condition. At the present time we have recognized 15 cases at the Massachusetts General Hospital: and we have used (tried) no treatment for these; that is, no treatment directed at the condition. I rather think that Jackson of Philadelphia feels that bronchoscopy is the ideal treatment. It may be the ideal treatment if there was a Jackson in every clinic: but at present I feel that to bronchoscope a patient after a serious abdominal operation would be a dangerous thing. I realize that in a case that persists, say, for five or six weeks, a bronchoscope should be called in to relieve the obstruction.

I forgot to speak about the mortality in the 15 cases at the Massachusetts General Hospital. There has been no mortality. They have all recovered.

Case Records
of the
Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN
WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY

RICHARD C. CABOT, M.D., AND HUGH CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 12021

SURGICAL DEPARTMENT

An American twenty-six years old, formerly a woodworker and chauffeur, was sent from the Out-Patient Department September 21 complaining of weakness and dyspnea. He had scarlet fever at three years, pneumonia at fifteen. He had worn glasses since he was eight years old. From the age of twelve to sixteen he had frequent headaches, sometimes keeping him in bed a week and accompanied by delirium. He had had two attacks of pleurisy, the second at twenty-one. Ever since he was twelve years old he had urinated three times at night.

Two years before admission, after having slight cough off and on, he vomited bright red blood three times without previous warning or history of stomach trouble. He had one hemorrhage one day and two the day following. He was sure that the three would have filled the bed pan. He felt very weak and was pale and dyspneic on exertion. He gradually regained strength, and after four months returned to work for three months. Then he had five more hemorrhages with less loss of blood than before. The attacks occurred without relation to meals and were preceded by cramp-like pain in the epigastrium, more on the right. After the last attack he was unconscious for two days and was taken to a hospital, where he remained five weeks. Enlargement of the spleen was noticed. He was given a blood transfusion. While in the hospital he had hemorrhoids and for one day pitting edema of the feet. After this he was in bed for three months, weak and dyspneic on exertion. The spleen had decreased in size considerably. Two years ago and six months ago he weighed 129 pounds. He now weighed 114. Upon admission he was only slightly weak and had only slight dyspnea and palpitation on exertion and no indigestion. He had never had fever or prolonged bleeding.

Examination showed a poorly nourished, anemic looking young man. The left eye tended to lag in looking up to the left and was not fully rotated to the left. The right eyebrow was slightly higher than the left. There were several decayed teeth. The heart showed no enlargement. There was a loud systolic mur-

mur at the apex and the base. The action was heaving, with pulsation of the neck vessels. The skin of the abdomen was slightly pigmented. The abdomen was full, slightly doughy. There was a hard, flat, slightly tender mass in the splenic area extending from the eighth interspace in the axilla to a point below the level of the umbilicus. The notch was not definite. Rectal examination showed slight hemorrhoids. The left pupil was slightly smaller than the right and slightly irregular. The pupillary reactions were normal. Examination of the fundi showed myopic correction with the ophthalmoscope, more marked on the left.

Before operation the temperature was 105° to 97.1°, the pulse 105 to 71, the respiration not remarkable. The urine was normal. (The amount is not recorded.) The hemoglobin was 60 per cent., the reds 4,900,000 to 4,980,000, with marked achromia, some anisocytosis, poikilocytosis and stippling. The platelets were considerably reduced. The reticulated count was 2 per cent. The leucocytes were 4,600 to 5,200, the polynuclears 80 per cent. At the first blood examination the red and white counts were repeated and checked three times. The bleeding time was four minutes. A Wassermann was negative. The coagulation time was 12 to 21 minutes, with calcium chlorid 26 minutes. A direct van den Bergh test was negative. A Rosenthal liver function test (dose 2.1 c.c. of dye) showed 30 per cent. of dye remaining in the serum after five minutes, none after thirty minutes. At a gastrointestinal X-ray examination September 23 the note was, "Reray without motor meal after the administration of atropin." September 24 after atropin the stomach was high, hyper-tonic, with normal peristalsis. The outline was everywhere smooth. There was no six-hour residue. The cap was small and difficult to fill. There was an irregularity at the base on the lesser curvature side. The head of the barium column had reached the sigmoid flexure. The cecum was smooth, freely movable. The appendix was seen, freely movable, not tender. X-ray examination of the chest showed the lungs normal, the heart shadow somewhat increased in size.

A surgical consultant advised operation and recommended that a donor for transfusion should be secured. September 30 operation was done. Transfusion was not necessary. The patient did very well for the first two days. October 4 there was slight temperature and some tenderness over the left upper quadrant. Next day there were some sticky râles in the left flank at the level of the diaphragm. The leucocyte count was 23,300 to 21,700, the red count 3,650,000 to 3,780,000, the hemoglobin 45 per cent. The reds showed several diffuse basophilic forms with definite achromia and marked poikilocytosis and anisocytosis. The temperature rose every evening to 101.5°-103.5°. The ab-

domen became distended with much gas. October 9 and again October 10 the patient vomited once. Nothing was found in the rectum. X-ray showed no change in the appearance of the chest except slight elevation of the diaphragm on the left. From this point the patient showed no improvement. The red count fell, reaching 3,380,000 October 12. The platelets, which had previously been increased, were now slightly decreased. The patient had constant epigastric discomfort, so that he would take nothing but hot fluids. There was now no distension. Blood cultures showed *streptococcus viridans* October 11. October 14 the red count was 3,360,000, the white count 35,000. October 17 there were 4,460,000 reds, 70,200 leucocytes with 94 per cent. polynuclears. Eight nucleated red cells were seen in looking over several fields. There was much stippling and diffuse basophilia. The pulse and respiratory rate were rising.

That day a second operation was done. The patient was in very poor condition after it. He was given a subpectoral of 2000 c.c. and 500 c.c. of 10 per cent. glucose intravenously, was put in shock position and given a shock enema. Ten units of insulin were given two hours after the glucose. That night he died.

Note by the senior house officer, Dr. L. M. Hursthal. Following operation the blood smear showed consistently 20-30 per cent. large mononuclear cells, occasionally vacuolated; but no definite phagocytosis was seen. These cells were the size of the large mononuclears found in normal blood, not the typical macrophages. On physical examination there was no evidence of embolism, i. e., petechiae, hematuria, or central nervous system disturbances. The heart showed no change from pre-operative examination. There was no clubbing of the fingers. Tenderness was over the old splenic area, suggesting thrombosis. The only etiology for previous valve damage was scarlet fever.

DISCUSSION

BY RICHARD C. CABOT, M.D., AND

BETH VINCENT, M.D.

NOTES ON THE HISTORY

1. "Five more hemorrhages." I take it he was still vomiting blood. It was still gastric hemorrhage.
2. The whole history of the present illness sounds like the hemorrhage of splenic anemia or Banti's disease.
3. "The notch was not definite"—but in every other respect the mass was exactly like a big spleen.

NOTES ON THE PHYSICAL EXAMINATION

4. So far as the physical examination goes we have enlarged spleen and that is all. We

cannot connect the slight irregularity of the eye and the eyebrow with what we have below the diaphragm.

Is the bleeding time somewhat delayed?

DR. BETH VINCENT: I think it is within normal limits.

DR. CABOT: I suppose the re-examination by X-ray after atropin was necessary because of spasm.

DR. HOLMES: Yes; the X-ray conclusions were drawn from the fluoroscopic examination and not from plates. We should not have been able to draw any conclusions from these plates except that the stomach emptied rather rapidly. I do not understand the record of "an irregularity at the base." The chest is apparently normal. The diaphragm is a little high, perhaps because of enlargement of the spleen. There is nothing in the lungs.

DR. CABOT: Everything points away from the stomach.

DIFFERENTIAL DIAGNOSIS

Now we come to the operation. What was it for? I think there is no question. Some people would have called it splenic anemia, others would have called it Banti's disease; still others would have called it cirrhosis of the liver. Osler and Banti tried to differentiate between these; but I think there is no proof of a real difference clinically.

DR. VINCENT: I think of Banti's disease as a terminal stage of splenic anemia in which there is cirrhosis of the liver. Sometimes it is impossible to make the differentiation between cirrhosis of the liver with an enlarged spleen and splenic anemia with a cirrhotic liver.

DR. CABOT: That is the classical distinction which Osler and Banti tried to make. If the liver is involved it would be very likely to show at operation the irregularities of cirrhosis.

PRE-OPERATIVE DIAGNOSIS SEPTEMBER 30

Splenic anemia.

FIRST OPERATION

Gas-ether. Left median rectus incision from below umbilicus to the level of the ensiform. There was no free fluid in the abdomen. The omentum was attached to one point on the outer surface of the spleen. The liver was firmer than normal, showing some irregularities on the surface outlined by light grey lines. The edge of the liver was indented,—apparently a moderate degree of cirrhosis without ascites. The gall-bladder was negative. Examination of the duodenum and stomach showed no signs of ulcer. The spleen was dark red, firm, and about three times the normal size. It was pathologically adherent, especially at the upper pole, although the adhesions were not unusually heavy or vascular. The spleen was

removed without a great deal of bleeding. The abdomen was closed without drainage.

PATHOLOGICAL REPORT

The spleen is symmetrically enlarged, measures 7 by 12 by 12.5 cm. and weighs 730 grams. On section it shows a firm fibrous deep red surface. Microscopic examination shows fibrosis of the reticulum. The sinuses of the pulp are filled with lymphoid cells. No megakaryocytes or nucleated red cells are present. The follicles contain germ centers.

Hyperplasia.

FURTHER DISCUSSION

DR. VINCENT: It can be said in general about operations on the spleen that the difficulties of splenectomy depend not so much upon the size of the spleen as upon the presence or absence of pathological adhesions and upon the density and vascularity of these adhesions. It is not difficult to remove a spleen with only the normal attachments; but a spleen that is pathologically adherent is very difficult and sometimes impossible to remove with safety. In a splenectomy the usual procedure is first to mobilize the spleen by separating the normal peritoneal attachments until the organ is delivered as much as possible from the abdomen. The pedicle is then ligatured *en masse*, or preferably the artery is tied before the vein. Pathological adhesions are sometimes present and may be very heavy, extensive and vascular. They bind the omentum and liver edge to the spleen and extend from the spleen surface to the anterior and posterior abdominal wall. Often they carry large veins which are a part of the collateral circulation, especially where there is cirrhosis of the liver and portal obstruction. The division of these vessels causes very severe hemorrhage in this operation. The only way to control this is by packing the bed of the spleen tightly with gauze as the spleen is elevated. Usually bleeding from the pedicle itself is easily controlled. The operation is done through a left median incision from the ensiform to below the level of the umbilicus. An additional transverse incision is necessary only in exceptional cases. Where there are very dense and vascular adhesions it is sometimes wise to make a transverse incision into the flank to make the spleen more accessible. As a rule we do not use drainage. In exceptional cases of severe bleeding it may be necessary to leave in a gauze pack. The end of this pack is best brought out at the outer angle of the transverse incision.

The convalescence in these cases is as a rule uneventful. There may be fever. There is sometimes pleurisy on the left side. Where there is a fatal outcome it is usually due to shock, hemorrhage; infrequently, as in this case, to thrombosis of the portal system.

DR. CABOT: You do not suppose there was pleurisy here?

DR. VINCENT: I do not think the examination showed it.

DR. HOLMES: The plate taken before operation showed the diaphragm a little high. This plate taken after operation does not show evidence of pleurisy.

DR. CABOT: The history just before the second operation sounds like a septic condition of some kind. I should not however be able to tell what the second operation was done for.

DR. VINCENT: This was not a normal convalescence. There was fever, but no vomiting until just before the second operation. There was some disturbance of the normal bowel movements. There was sensitiveness on palpation over the abdomen. There was distention and an ascending white count. A high leucocyte count is said to be characteristic of mesenteric thrombosis. I had that in mind all through this convalescence. In the last twenty-four hours before the second operation the picture changed. There was increased abdominal pain and distention. He vomited once or twice, a black vomitus. Our diagnosis was intestinal obstruction probably due to mesenteric thrombosis. An emergency operation was done without much hope of saving the patient. We felt a tender mass just above Poupart's ligament before operation. This proved to be an edematous thickened loop of gut with a thrombosed mesentery.

PRE-OPERATIVE DIAGNOSIS OCTOBER 17

Intestinal obstruction.

SECOND OPERATION

The abdomen was opened under ethylene anesthesia, and was found to contain considerable clear fluid. About three feet of the terminal ileum presented a firm thickened wall for the most part. One portion of the gut wall was dark, soft, and showed a beginning gangrene. The mesentery of this portion of the bowel was thick and edematous; evidently the veins were thrombosed. Some fibrin on the thickened loop but no evidence of peritonitis. Without further exploration this loop of bowel was excised, the two ends brought out through the abdominal wound and into both ends glass tubes were inserted. The patient left the table in poor condition.

PATHOLOGICAL REPORT

A section of intestine 42 cm. long with the mesentery. Its peritoneal surface is purplish red and covered with plaques of fibrin. The walls of the mesentery are thickened. Many of the mesenteric vessels are thrombosed. There is no ulceration in the mucous membrane. Microscopic examination shows the walls of the intestine and folds of the mesentery filled with

fluid and wandering cells. The small blood vessels are distended with blood, but there is no evidence of hemorrhage in the tissues. The appearances suggest an early stage of infarction before hemorrhage and necrosis are established.

FURTHER DISCUSSION

DR. CABOT: The edema and thickening of the gut wall made the tumor felt in life?

DR. VINCENT: We did not interpret it so at the time, but later it was easy to account for the tumor in this way.

DR. CABOT: I suppose we must think there is a good chance of peritonitis. We know bacteria can work through the walls of a gangrenous gut. With this streptococcus culture in the blood there is a possibility of a fresh endocarditis.

DR. VINCENT: The viridans was never found but once. It is not however an ordinary contamination.

DR. CABOT: What shall we find post-mortem? There is a good chance for peritonitis, local, probably general. There is a fair chance of an acute or subacute endocarditis and of a cirrhosis. The ordinary collateral circulation may show up. There is no reason to suppose there was trouble in the chest.

DR. MARK H. SMITH: Dr. Cabot, four years ago you said in discussing a case that hematemesis without known cause or previous gastro-intestinal symptoms usually means cirrhosis of the liver. Is that your present belief?

DR. CABOT: Yes. Hematemesis "out of a clear sky" usually means cirrhosis.

A PHYSICIAN: Will you repeat the grounds of your diagnosis of mesenteric thrombosis?

DR. VINCENT: It was necessarily based on slender grounds. There was evidence of abdominal pain and tenderness and intestinal disturbance. An ascending white count is said to accompany thrombophlebitis; and thrombosis of the portal system is a well recognized complication of splenectomy.

DR. CABOT: Why should such an operation as this tend to lead to mesenteric thrombosis?

DR. VINCENT: I do not know. We have observed it several times.

A PHYSICIAN: Can you account for it on the basis of subacute endocarditis?

DR. CABOT: No.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Banti's disease.
Septicemia.
Mesenteric thrombosis.
Splenectomy.
Resection of ileum for mesenteric thrombosis.

DR. RICHARD C. CABOT'S DIAGNOSIS

Banti's disease.
Post-operative sepsis.

ANATOMICAL DIAGNOSIS

1. Primary fatal lesion

(Banti's disease.)

2. Secondary or terminal lesions

Splenectomy.

Thrombosis of the portal vein and its great radicles.

Edema of the lungs.

Right hydrothorax.

DR. RICHARDSON: This was a restricted examination. There was a slight amount of fluid in the peritoneal cavity but no definite evidence of peritonitis. A piece of the small intestine was wanting, beginning about 7 cm. above the ileocecal valve. The remaining portion was negative except that the serosa in places showed some reddening, and there was some injection of the vessels.

In the right pleural cavity there was 700 c.c. of thin pale fluid, in the left 200 c.c. There were no adhesions. The pericardium was negative. There was no evidence whatsoever of any endocarditis. The aorta was negative, the superior and inferior mesenteric arteries negative.

The liver was of good size. In a few scattered places there were evidences of slight cirrhosis. The spleen was wanting.

Coming to the portal vein and its radicles, the system was practically occluded by frank thrombotic material. This material generally was rather firm and meaty, but showed no evidence anywhere of purulent softening.

A culture from the heart blood was negative.

Did I understand you to say that you do get temperatures in these thrombotic cases?

DR. VINCENT: I do not know much about that. There was temperature in this case, but I should expect to have it in thrombotic phlebitis.

DR. RICHARDSON: We have found here that with thrombi and infarcts there is an associated temperature at times. The culture of the viridans is interesting. I took a culture from the heart blood, and it was negative.

DR. VINCENT: What is the habitat of the viridans,—the intestinal canal?

DR. RICHARDSON: No. The only way I know that the viridans might be found in the peritoneal cavity is as follows. We had two cases of endocarditis where an infected embolic mass carried down into the spleen infected the spleen and from there extended to the neighboring peritoneum, setting up a peritonitis.

A PHYSICIAN: Why should there be such a high leucocytosis? Is there any reason?

DR. VINCENT: I do not know. I know it was pointed out at the time that this was consistent with the portal thrombosis.

CASE 12022

SURGICAL DEPARTMENT

A Canadian mechanic sixty-three years old entered June 18. His past history was negative except for scarlet fever in his youth.

Eleven years before admission he had intermittent sharp pain in the right upper quadrant, not related to meals and not radiating. The pain was very severe the first day, slight afterwards. He stayed away from work six weeks. Six months before admission he had a sudden onset of the same sort of pain, severe on deep breathing. There was tenderness in the right upper quadrant on light pressure. Four days before admission he had a third attack, severe for the first three days, coming in attacks lasting two or three hours, relieved if he half doubled over and did not breathe deep, then catching him with a sharp twinge.

Examination was negative except for tenderness in the right upper quadrant on fairly deep pressure. No spasm was elicited. The blood pressure was 100/65.

Before operation the temperature was 100.2° to 98°, the pulse 85 to 75, the respirations normal. The urine and blood are not recorded. A Graham test was done. A film of the abdomen showed four of the capsules which had failed to dissolve. The subsequent tests therefore are quite inconclusive. There was however a pyriform shadow visible beneath the last rib with something the appearance of the gall-bladder. Its density however was not so great as that usually seen. It probably would not be so dense owing to the failure of the drug to dissolve. The findings were inconclusive.

June 20 operation was done. Next day the patient was doing well, though the heart was apparently fibrillating. He was given digifolin. June 22 the pulse was steady, 100 to 108. The temperature was 98.1° to 100°. He did not look well. June 27 the temperature was coming down and he looked a little better. He was given subpectorals of 2½ per cent. glucose twice a day. June 29 the temperature was 99.5° by rectum. The urine was negative. There was some swelling of the ankles and legs. The sensorium was dull. There was slight vomiting. A medical consultant found some weakness of the heart muscle, but not enough in his opinion to account for the degree of edema and cyanosis of the feet. July 2 the patient looked much better. His mind was rational and active and his appetite stirred for the first time. A nasal tube was inserted to the stomach or the duodenum and he was fed every hour. After the passing of the tube he had hiccups. July 5 he showed great improvement. Two days later however he was apathetic and very weak. The next day he had rapid pulse and respiration with noisy

breath sounds, and looked very ill. During the next two days the lung signs disappeared and he gradually improved, but was not so strong as before. The drainage wound showed little tendency to heal, though the rest of the wound was well healed. July 13 a portable chest plate showed distinct scoliosis of the lumbar spine. The entire right lung field was less radiant than the left. The peripheral margin of the lower right chest was increased in density of a rather homogeneous character, obliterating the lateral margin of the diaphragm and the costophrenic angle. There was also some mottled dullness of the upper half of the right lung. The heart shadow was displaced somewhat to the right. The left apex was less radiant than usual. It was thought this deformity might be accentuated by the deformity of the spine and the narrowing of the intercostal spaces. July 14 a medical consultant found evidence of an old inactive process at the right top and dullness with distant to absent breathing in the right lower back. The leucocyte count was 23,000. Next day a chest tap was done with the recovery of 250 c.c. of viscid amber fluid which seemed to be a transudate. A culture was sterile. The septic temperature continued. July 19 another chest tap gave 150 c.c. of a cloudy red fluid, specific gravity 1.018, 48,000 red cells, 3,000 whites, 87 per cent. polymorphonuclears, 12 per cent. lymphocytes, 1 per cent. large mononuclears. Culture showed a moderate growth of pneumococci, colon-like bacilli and Gram-positive bacilli.

July 24 another portable X-ray showed that the dullness at the right base had cleared up to a large extent, so that the right diaphragm and costophrenic angle could now be plainly made out. Otherwise the findings were the same as at the last observation. A high degree of motion obscured the finer lung details.

The patient did not gain. A bed sore which he had had for some time now became much worse. August 4 there was more fluid in the chest. He was running an irregular fever. He sank more rapidly, and August 7 died.

DISCUSSION

BY RICHARD C. CABOT, M.D.

The blood pressure is notably low.

I suppose they operated for gall-stones.

DR. WILLIAM P. COUES: I should think so. But it is rather unusual that there should be such a long intermission after this attack.

DR. CABOT: Still I cannot make any better diagnosis than cholecystitis with or without gall-stones, presumably with.

PRE-OPERATIVE DIAGNOSIS

Acute cholecystitis.

OPERATION

Gas-ether. A right rectus muscle splitting incision was made and a large tense gangren-

loosened from its bed, making it necessary to take it out. While stripping the gall-bladder from the liver a large vessel started to bleed.



Shows distinct scoliosis of the lumbar spine. The entire right lung field is less radiant than the left. The peripheral margin of the lower right chest is increased in density of a rather homogeneous character, obliterating the lateral margin of the diaphragm and the costophrenic angle. There is also some mottled dullness of the upper half of the right lung. The heart shadow is displaced somewhat to the right. The left apex is less radiant than usual. It was thought this deformity might be accentuated by the deformity of the spine and the narrowing of the intercostal spaces.

ous gall-bladder was found. The omentum was adherent all over the top of the gall bladder. On removing the omentum the gall-bladder was

The bleeding was controlled by clamps with considerable difficulty and after the losing of considerable blood. Numerous stones were re-

moved with a scoop and the gall-bladder was then amputated about an inch from the common duct. There were stones still left in its base, which the surgeon was unable to get out. There was no bleeding at the end of operation. The liver bed was packed off with gauze and a cigarette wick.

PATHOLOGICAL REPORT

A gall-bladder 5 to 10 cm., purplish in color. It shows all the signs of acute inflammation with necrosis.

Acute cholecystitis.

FURTHER DISCUSSION

DR. CABOT: Have we had any lung signs before?

A PHYSICIAN: Noisy breath sounds were all.

DR. CABOT: That is not much.

DR. HOLMES: The most striking thing about this plate is the marked retraction of the right chest. The intercostal spaces are very much narrowed, the diaphragm is high, the heart and mediastinal contents displaced toward that side, and there is lateral curvature of the spine. Of course that is nothing that has occurred since the operation. We could not expect that deformity in the bony thorax without a long history. The whole chest too is less radiant than the other side, and at the extreme base in the region of the costophrenic angle there is some dullness. In addition to that there is a line running down the midportion of the plate which looks like a tube.

DR. CABOT: That is the tube they are feeding him with, I guess.

DR. HOLMES: The left lung is unusually bright, probably a compensatory emphysema. Such an appearance as this might be due to an old empyema with incomplete expansion of the lung on that side. I do not believe it has any bearing on the present illness.

DR. CABOT: Is there anything that might bear on any such possibility as abscess of the liver? He is doing badly after operation, and that is one of the possibilities.

DR. HOLMES: The diaphragm is high on that side and may be fixed. The signs that we should usually look for are obscured by the old process.

DR. CABOT: All that you see there you would say is due probably to old disease in the lung and elsewhere. He certainly has an infection in his chest now, whether or not he had it before his first tap.

A PHYSICIAN: The record does not say which chest was tapped.

DR. CABOT: No, but I assume it was the right, because all they said has been about the right.

DR. HOLMES: That small area of dullness in the costophrenic angle might be fluid, the result of the old infection.

DIFFERENTIAL DIAGNOSIS

DR. CABOT: They do not say anything about what is going on below the diaphragm, so I do not see any reason to suppose he had peritonitis. After an unsatisfactory gall-bladder operation we always think of peritonitis. But if he had it I do not see any evidence on which we can make the diagnosis here.

DR. COUES: I think we have to consider the possibility of subdiaphragmatic abscess. The blood pressure of only 100 is striking at his age.

DR. CABOT: I do not see that it helps us as to what is the matter.

DR. COUES: No, not at all.

DR. CABOT: Now here is a man who has a gangrenous gall-bladder. They know they did not get all the stones out. Apparently it was not a very satisfactory operation. He hangs on to life for six weeks after the operation and finally dies. I think we must say that he dies of sepsis. I cannot imagine what else. Chronic sepsis and not acute general peritonitis. Where does his chronic sepsis come from? Well, I think there is some of it in that right chest, which was evidently, as Dr. Holmes pointed out, crippled before. I think we have to say empyema in the right chest, and I should suppose there was local suppuration in the gall-bladder, either in the liver or close to it, in addition to the empyema. It is the sort of case in which we get a thrombosis of the portal vein, but I do not see any evidence of it. We ought to get more abdominal symptoms than he has if he has thrombosis of the portal vein. It is also the sort of case in which we get acute endocarditis. But of that we have no evidence either.

So I should suppose the diagnosis would be local sepsis (empyema) above his right diaphragm and below it, in or near the liver. I can think of nothing else. Is there anything to add, Dr. Coues?

DR. COUES: I think Dr. Richardson will tell us that there is some definite local sepsis or some sort of abscess fixed between the liver and the diaphragm, something around the gall-bladder too.

DR. CABOT: Of course we must not forget his bedsores, which is a very real source of sepsis and of drain on the patient. But I do not believe it is a main cause.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Cholelithiasis.
Empyema.
Operation, cholecystectomy.

DR. RICHARD C. CABOT'S DIAGNOSIS

Cholecystitis.
Chronic sepsis with suppuration in the
pleura and in or about the liver.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

(Acute cholecystitis.)

2. *Secondary or terminal lesions*

Fibrinopurulent pleuritis.
Abscesses of the lungs.
Embolie thrombosis of branches of the pulmonary artery in the lungs.
Thrombosis of the inferior vena cava and left iliac system.
Fatty metamorphosis of the liver.
Soft spleen.
Scar of operation wound with sinus leading down to region of the gall-bladder.

3. *Historical landmarks*

Chronic pleuritis.
Obsolete tuberculosis of the bronchial glands and apex of the left lung.
Chronic peritonitis.
Arteriosclerosis.
Decubitus.

DR. RICHARDSON: He was poorly nourished. We were not permitted to examine the head. There was a long linear scar in the anterior abdominal wall, the suture marks still visible. At the upper end of the scar there was an open wound three centimeters long. The abdomen was hollow, the wall soft. In the region of the sacrum there was an area of decubitus. The muscles were thin and pale.

The peritoneal cavity was moist. There was no evidence whatever of acute peritonitis. The stomach was rather small, the mucosa and pylorus negative. The hepatic colon was bound to the region of the gall-bladder by old adhesions. There were some old adhesions between the coils of the intestines, but these produced no definite constriction of the intestines, which were otherwise negative. The anterior margin of the liver was two centimeters above the costal border. The diaphragm was at the

fifth rib on the right, the fifth interspace on the left.

Pleural cavities: the right was obliterated by old adhesions. On the left side there were a few adhesions at the apex and a few to the diaphragm. In the left pleural cavity there were 100 c.c. of thin cloudy fluid and fibrin.

The trachea and bronchi contained much thin reddish frothy fluid. A few of the bronchial glands showed fibrocalcereous degeneration,—obsolete tuberculosis.

In the apex of the left lung there was an area of obsolete tuberculosis. The tissue of the left lung elsewhere showed some edema and a small abscess at the lower tip of the upper lobe. Right lung; there was a negative apex. The tissue generally showed much edema, and the visceral and parietal pleurae were thickened, bound together by adhesions, and between them in places over the lower lobe were patches of fibrinopurulent material with hemorrhagic areas. Beneath one of these patches there was some purulent infiltration of the lung tissue. Again in the region of the lower part of the lower lobe anteriorly, just beneath the thickened pleura, there was a frank abscess in the lung tissue three and a half centimeters across. In the region of the lower tip of the left upper lobe, extending from the pleura inward, there was another very small abscess. The lungs presented, then, the adhesions on the right binding the pleural layers together, with here and there collections of pus, one of which extended into the lung tissue for a considerable distance.

A PHYSICIAN: How near was his diaphragm to his liver?

DR. RICHARDSON: It rested over it in the usual situation.

The heart weighed 250 grams, with good valves and negative cavities. The coronaries were free and negative. There was a slight amount of arteriosclerosis in the aorta, and some in the great branches. The main stem and primary branches of the pulmonary artery were negative, but distant branches were occluded by frank thrombotic material, and the inferior vena cava a short distance above the junction of the common iliac veins was occluded by a frank thrombotic mass which extended down into the left iliac system as far as the femoral vein. The cystic duct was closed off and the hepatic and common ducts were nega-

tive. The pancreas and the duct of Wirsung were negative. The spleen, adrenals and kidneys showed nothing to note except that the splenic tissue was soft.

DR. CABOT: How do you read the whole of this case? You have heard the clinical history; you know what they did. What is the succession of events so far as you can scheme it out?

DR. RICHARDSON: His pleura was infected somehow or other.

DR. CABOT: He had a gangrenous gall-bladder. They took it out. What is the chain of events from that point on?

DR. RICHARDSON: They tapped him once and got clear fluid. The next time they got a fluid that was not so clear. All the disturbance in these lungs is in the region of the periphery. What time was it when his legs swelled up?

DR. CABOT: Yes, that I suppose was connected with this old venous thrombosis.

DR. RICHARDSON: That may give a hint as to when the infection came in.

DR. CABOT: It was over a month before he died that he was operated on.

DR. RICHARDSON: Was that before or after he was tapped?

DR. CABOT: It was before he was tapped.

DR. RICHARDSON: Then that looks as though somehow or other, if we suppose that the thrombosis of the iliac system and the vena cava was set up at that time, he must have had an infection previous to that.

DR. CABOT: How about these abscesses of the lungs?

DR. RICHARDSON: They were associated with the purulent pleuritis.

DR. CABOT: There was one on the other side.

DR. RICHARDSON: That was very small. The process was much more extensive on the right.

DR. CABOT: Then shall we say something like this: Here is a man who gets a sepsis in his gall-bladder. He is operated, but that does not stop it. He then gets a septic thrombosis in his cava that gets spread to his lungs and pleura, and there we are.

DR. RICHARDSON: Yes. The difference in the tap fluids might be that they happened to hit a place the first time where it was clear, and the next time they hit the real spot.

A PHYSICIAN: Could you have an encapsulated fluid extending for years?

DR. RICHARDSON: Yes.

A PHYSICIAN: Or it might have remained from his infection of years ago.

CASE 12023

SURGICAL DEPARTMENT

A man of seventy-seven entered October 19 complaining of nausea and vomiting. His mother died of tuberculosis when he was nine years old. His wife had never been pregnant. Forty years before admission he was somewhat run down and had slight cough, hemoptysis and chest pains. After two years in Colorado he came back entirely well, and had had no other symptoms referable to the heart and lungs except dyspnea on slight exertion. He had worked steadily as a millwright in a wood working factory for thirty years until the year before admission.

For the past year he had had an "uneasy feeling" in the epigastrium and the right hypochondrium coming on after supper and relieved by vomiting. There were crackling sounds at night associated with a feeling of distress, relieved by lying on his right side, when he "felt something come through inside." A physician gave him medicine which relieved him. Two weeks before admission he had severe diarrhea for four days, accompanied by nausea and vomiting. The vomitus was yellow at first, later greenish, and eleven days before admission black. He vomited three or four times a day, about half a cupful at each time. Ten days before admission the diarrhea gave place to constipation, his bowels moving four times in ten days. The stools had been tarry for three days, with small amounts of blood. He had had severe cramp-like pain in both thighs and legs. He had lost no weight during the past year.

Examination showed a dried-out, emaciated old man of poor general appearance. The skin was pale and relaxed, showing evidence of loss of weight. The tongue was dry and furred, the throat dry and reddened. The spine was stiff and unyielding. The chest was barrel shaped and showed limited expansion. There was asthmatic breathing. The heart sounds were flabby and distant. The apex impulse was not found. The percussion measurements are not recorded. The heart showed no marked

abnormalities. The blood pressure was 150/90. The radials were palpable, the temporals and brachials tortuous. The prostate was somewhat enlarged. The examination was otherwise normal.

Before operation the temperature was 96.5° to 98°, the pulse 120-60, the respiration 20 to 32. Before operation the urine showed the slightest possible trace of albumin, no acetone, five leucocytes and rare red blood corpuscles per high power field, specific gravity 1.015. The amount is not recorded. The hemoglobin was 100 per cent., the leucocytes 13,000. X-ray of a barium enema showed some dilatation of the rectum and rectosigmoid and a persistent filling defect involving the distal portion of the sigmoid at the rectosigmoid junction. There was some delay of the barium at this point. After passing this point the barium passed around the cecum without delay. The other portions of the colon appeared normal in contour. There was some spasm in the region of the splenic flexure but no definite filling defect suggestive of organic disease. The filling defect observed in the rectosigmoid was constant and was observed in both films. It was thought it might be due in part to spasm. It was very suggestive of a lesion at this point. The examiner suggested that the findings be confirmed by direct examination if possible.

The patient vomited once up to the evening of October 20. He was given 500 c.c. of 10 per cent. glucose intravenously and 2,000 c.c. of saline subpectorally that evening. He suffered considerably from asthmatic attacks, relieved by adrenalin.

October 21 operation was done. The patient went steadily downhill after it. He continued to vomit. His lungs rapidly filled with coarse moist râles. His breathing was labored. The non-protein nitrogen was 260 mgm. per 100 c.c. October 21. The next morning however the urinary output was 30 ounces and the urine contained only the slightest possible trace of albumin. The pulse gradually grew weaker. Early in the evening October 22 he died.

DISCUSSION

BY EDWARD L. YOUNG, JR., M.D.

As this man tells us his story we have enough in it alone to point very definitely to the intestinal tract. The immediate story of two weeks'

duration sounds very much like the irritation and then obstruction due to a malignant disease in the large bowel.

It seems very hard to place any connection between his present condition and the probable tuberculosis of forty years ago, although the tuberculous infection of the lungs is often accompanied by tuberculous ulceration of the bowel. Forty years seems a long time between the original infection and such symptoms as he now complains of. The very indefinite sensations which he has been having for the past year are also very hard to fit into the picture, although they are undoubtedly due to the slowly increasing condition which is now presenting itself as an acute situation.

The examination shows that he is indeed very sick. The extreme loss of weight points to a serious situation. The dehydration is of very great importance in the immediate prognosis, and the whole examination points to a very poor surgical risk. The X-ray bears out the initial diagnosis and points to a malignant disease near the rectosigmoid junction. An attempt was made to relieve the dehydration and acidosis by the use of subpectoral fluid and intravenous glucose. It is always necessary in cases such as this to supply the lack of fluid and carbohydrate in order to get the patient in the best possible condition for the strain of operation.

In this case I see no possible diagnosis to make other than carcinoma, and exploration may even now show that it is beyond the reach of anything more than palliation. I should assume that the only thing that would be justified at the first operation would be exploration to see whether or not there is a situation which can later be attacked with some hope of success, and to do a colostomy above the growth in order to give him a chance to build up still further before a radical operation.

DR. YOUNG'S PRE-OPERATIVE DIAGNOSIS

Carcinoma of the sigmoid.

PRE-OPERATIVE DIAGNOSIS

Cancer of the sigmoid.

Intestinal obstruction.

OPERATION

Local novocain. On opening the abdomen the bowel everywhere was collapsed. No mass could be felt. In view of the persistent vom-

iting a colostomy was done for probable obstruction above, although this could not be clearly demonstrated.

FURTHER DISCUSSION

The least upsetting operation was done. It gives us the somewhat disconcerting information that there was no mass that could be felt. I have seen this same thing happen only twice, and the causes which were present in those cases are the only things I can offer as an explanation for the present situation. Once it was a terminal acidosis in a diabetic, and in the other case it was a terminal stage of nephritis. The non-protein nitrogen here suggests that the uremic hypothesis might possibly fit. Of course the fact that the urine contained only the slightest possible trace of albumin does not disprove the presence of uremia. I have no other suggestion to offer unless the surgeon actually missed a mass which was present.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Partial intestinal obstruction from carcinoma of the sigmoid.

Arteriosclerotic heart disease.

Acidosis.

Cecostomy.

DR. EDWARD L. YOUNG'S DIAGNOSIS

Chronic nephritis?

ANATOMICAL DIAGNOSIS

1. Primary fatal lesions

Arteriosclerosis of the coronary arteries with partial obstruction.

Chronic myocarditis.

2. Secondary or terminal lesions

Superficial ulcer of the duodenum.

Cecostomy.

Hemorrhagic edema of the lungs.

Arteriosclerotic degeneration of the kidneys.

3. Historical landmarks

Chronic pleuritis.

Slightly defective closure of the foramen ovale.

DR. RICHARDSON: The head was not examined.

The peritoneal cavity, appendix, esophagus and stomach were negative. There was some reddening of the mucosa of the stomach.

In the mucosa of the posterior wall of the

duodenum a short distance below the pylorus there was a small superficial ulcer with dark reddish smooth base. The intestines otherwise were negative. In the wall of the cecum there was a cecostomy wound.

On the right side there were a few old pleural adhesions to the diaphragm, on the left side a few at the apex.

There were no areas of consolidation in the lungs. The tissue generally showed much hemorrhagic edema.

The heart weighed 343 grams. In the myocardium there were many small scattered areas of fibrosis. The valves were negative. The right coronary artery was free but showed considerable fibrous and fibrocalcereous sclerosis with diminution of the lumen in places. The left coronary showed much fibrous and fibrocalcereous sclerosis with marked diminution of the lumen in places.

The ascending thoracic portion of the aorta was quite smooth. The arch and the remaining portions and the great branches showed only a slight amount of fibrous sclerosis. The pulmonary artery, veins, venae cavae and portal vein and radicles were negative.

The liver, gall-bladder, bile ducts, pancreas, and duct of Wirsung were negative.

The spleen was rather small but otherwise negative.

The kidneys combined weighed 360 grams. The capsules were slightly adherent in places. The surfaces generally were fairly smooth. The tissue was of good consistence, with retained markings and cortex of 5-6 mm. The cut ends of the vessels showed fibrosis. The microscopic examination showed arteriosclerosis and focal atrophy. The pelves, ureters and bladder were negative. There was a small hydrocele on each side.

DR. YOUNG: In view of what Dr. Richardson tells us all I can say is that I have no comment. I should like to ask Dr. Richardson if that ulcer of the duodenum which he speaks of could have existed for a year and whether it could have been the cause of any of the symptoms of the past two weeks. Other than that we have to recognize another set of symptoms which can be caused by arteriosclerosis.

DR. RICHARDSON: It may well be associated with the late symptoms in the case, as the lesion was recent in type and there was no evidence of its being a year old.

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PAST AND PRESENT IN MEDICINE

EACH generation, in its time, owns the world. The future is still unborn and not to be reckoned with, and the sum total of the ages of the past has value in our eyes only as a foundation for the present and only in so far as they have contributed to it. When we are in the spotlight the stage is ours; when we move out of it the stage is darkened so far as we are concerned. Other companies may have played upon it and others will certainly appear, but such is our egotism that for us these scarcely exist.

It is an interesting thing, however, for us in medicine—let here our egotism assert itself!—to reflect occasionally on how little the pattern really changes; how much we are indebted to the past for our present knowledge, and, when priding ourselves on the improvements that have been wrought by a departure from the past, to reflect on how great will be the departure of the future from our present knowledge and how much that is up-to-date today will be antiquated or even the object of patronizing ridicule tomorrow. A knowledge of that which has gone before is illuminating and instructive, and if, in realizing how little that is modern is really new, a sense of humility

breaks through the crust of our conservative self approval, who will say that any harm has been done?

John Ruhräh has been a student of the past to his own benefit, and for our benefit has prepared a collection from the pediatric literature of the past which Garrison labels "at one and the same time, an anthology and a chrestomathy and a source book." In discussing this collection his own sense of humor impels him to point out, at frequent intervals, wherein the present is no better than the past and his sense of justice leads him to comment favorably on those instances wherein the past has been about as good as the present. His own quotation;

"Be not the first by which the new is tried,
Nor yet the last to lay the old aside."

is a fair commentary on these literary investigations.

No allusion to the earlier advances in medicine escapes some reference to Hippocrates, and the fact that Hippocrates had observed faithfully in the pediatric field is attested to by certain of his aphorisms: "Elderly people bear fasting well; infants poorly, especially those of lively disposition (i, 13).

"The diseases of the newborn and of infants are apthae, vomiting, insomnia, night fears, inflammation of the umbilicus, and discharges from the ears (iii, 24).

"At teething, there are pruritis of the gums, convulsions and diarrhea, especially when cutting the canine teeth, and in fat constipated infants (iii, 25).

"A little later there are tonsillar affections, erick in the neck, asthma, calculus, round worms, warts, scrofula, tumors about the ears and elsewhere (iii, 26).

"Those who acquire a gibbous spine with cough and asthma, before puberty, die (vi, 46)."

Many of the descriptions of disease, such as that of diphtheria by Aetius of Amida (507-579 A. D.), and, indeed many others, can hardly be improved upon, and much of the general common sense advice such as that given by Bartholomaeus Metlinger (1491) on the general rule for the care of infants, greatly resembling a modern welfare pamphlet, is about as valuable today as it was then. It is in the theory of disease and its treatment that this old fashioned medicine seems primitive to us, for we rarely take time to realize how primitive much of our theory and practice will seem to succeeding generations. Thus we learn from Metlinger, who was so sage when he wrote concerning what he knew about, that urinary calculi come in children because the mother eats much cheese, or many whortleberries, brown berries or elderberries, and from Cornelius Roelans (1450-1525)—gland therapists of today take notice that wolves's culture's gall cure hydrocephalus. Sheep's pancreas may be

specific in diabetes, but it is yet to be proven that bovine adrenals will cure Mongolian idiocy. It is easy to laugh at Thomas Phaer's specific for "Wynde in the Eares and Tinklyng" which consists in the following:

"Take myrre, spykenarde, cumyne, dylle, and oyle of camomyl, and put a drop in ye eares. They that have not al these, may take some of them, and applye it accordyng to discretion.

"To amende deafnesse ye shal make an ointment of an hares galle, and the grese or drop-pyng of an ele, which is a souerayne thying to recover hearynge," but he who laughs last laughs best!

MEDICAL EDUCATION AGAIN

THE JOURNAL has on more than one occasion taken the liberty of expressing its opinion freely on present day trends in medical education, which it believes to be wrong ones. Without in any way deerring scientific investigation, for which it has a wholesome respect and the utmost admiration, it nevertheless believes that the fundamental object of a medical school is to train young men for the practice of medicine, and that this target, instead of being hit, is not always even being shot at. Research—and that measured by volume rather than quality—has become in some instances almost the only criterion employed in the selection of instructors in medicine, and almost the only basis on which advancement along academic lines is secured. Young men who have not even begun to learn practical medicine are encouraged and almost commanded to do investigative work, regardless of their capacity or natural leanings. The adage of the blind leading the blind is striking home.

This criticism is not a new one. Dr. Pusey sounded it while president of the American Medical Association, and the survey conducted by Dr. Matthias Nichol, Jr., on medical service in rural communities, or the lack of it, pointed to over-intensive training as one of the causes. Another Daniel has come to judgment in the person of Dr. Edward H. Ochsner of Chicago, who writes on the need of more well-trained practitioners of medicine in *Science* (December 25, 1925). Dr. Ochsner boldly expresses his opinion—and it is a decided one—that the medical education of today is not as good as it was twenty-five years ago, and one fault lies in the fact that the personnels of our medical schools cannot teach medicine because they do not know medicine. "Who," he asks, "would want to learn to fly from an instructor who had never flown himself? The really efficient general practitioner needs to know a thousand and one things that make for efficiency, that give comfort and relief to his patient, which

the non-medical teachers and specialists cannot possibly teach because they do not know these important things themselves."

Furthermore Dr. Ochsner believes that the American people are going to have medical attention when they need it, and if, by failing to keep up the supply of competent physicians the medical profession cannot furnish it, the bars will be more readily let down to permit practice by the irregular cults.

"What we need," according to Dr. Ochsner, "is not more research workers to discover new facts but a few great medical minds who can take the great number of facts already known, separate the non-essential from the essential, arrange and classify them properly so that the latter can be more easily gotten hold of by the student. What we need even more than this is a larger number of medical teachers who can and will teach medical students the essentials of medicine in the shortest possible time without cluttering up their minds with a lot of non-essentials. . . ."

A five year survey of medical education is under way, conducted by Dr. Willard C. Rappleye, formerly professor of hospital administration at Yale. What it will show will be interesting, although we can guess the results; any suggested remedial measure will be still more interesting. The great question is, when a horse has been led to water, can he be made to drink?

THIS WEEK'S ISSUE

Contains articles by the following named authors:

O'HARE, JAMES P., A.B.; M.D. Harvard Medical School 1911; Associate in Medicine, Peter Bent Brigham Hospital and author of several articles on Nephritis and Hypertension;

ALTNOW, HUGO OSKAR, M.D. University of Michigan 1907; Former Associate in Medicine, Peter Bent Brigham Hospital;

CHRISTIAN, THOMAS D., JR., M.D. Harvard Medical School 1923; Assistant Resident Physician, Peter Bent Brigham Hospital;

CALHOUN, ABNER W., M.D. Harvard Medical School 1923; Assistant Resident Physician, Peter Bent Brigham Hospital;

SOSMAN, MERRILL CLARY, M.D. Johns Hopkins University Medical Department 1917; Radiologist, Peter Bent Brigham Hospital. The paper contributed by these authors is entitled "Chronic Nephritis Produced by X-Ray."

ROOT, HOWARD F., A.B.; M.D. Harvard Medical School 1919; Assistant Physician, N. E. Deaconess Hospital; Associate in Medicine, Peter Bent Brigham Hospital; and

WARREN, SHIELDS, A.B.; M.D. Harvard Medical School 1923; Assistant in Pathology, Boston

City Hospital; Instructor in Pathology, Harvard Medical School. They write on "A Clinical and Pathologic Study of Twenty-Six Cases of Diabetes."

TORREY, GEORGE L., JR., M.D. Harvard Medical School 1903; F. A. C. S.; Member, American Academy of Ophthalmology and Otolaryngology, etc. The subject of his paper is "An Attempt at the Differential Diagnosis of Lateral Sinus Infection."

RICHARDS, LYMAN G., M.D. Harvard Medical School 1919; Surgeon in Otolaryngology, Children's Hospital and Associate in Otolaryngology, Peter Bent Brigham Hospital. His subject is "A Corn Kernel in the Bronchus."

HUNT, ERNEST L., M.D. Harvard Medical School 1902; F. A. C. S.; Surgeon and Surgical Director, Worcester City Hospital; Member, N. E. Surgical and American Urological Societies. His subject is "Massive Atelectasis of the Lung as a Surgical Complication."

MISCELLANY

SUMMARY OF MORTALITY STATISTICS

TELEGRAPHIC returns from 65 cities with a total population of twenty-nine million for the week ending December 26, indicate a mortality rate of 12.1 as against 12.8 for the corresponding week of last year. The highest rate 24.0 appears for Houston, Tex., and the lowest 5.2 for Flint, Mich. The highest infant mortality rate (127) appears for Camden, N. J., and the lowest for Cambridge, Mass., Paterson, N. J., Salt Lake City, Utah, and Wilmington, Del., which reported no infant mortality.

The annual rate for 63 cities is 12.7 for the fifty-two weeks of 1925, against a rate of 12.5 for the corresponding period of 1924.

CONFERENCE OF SWIMMING POOL OPERATORS

A SUCCESSFUL conference for swimming pool operators arranged by the State Department of Health was held at Hartford on December 29, with representatives from Naugatuck, Willimantic, Hartford, Torrington, Waterbury, West Hartford, Meriden, New London, New Haven and Storrs in attendance.

Control of swimming pools in Hartford during the last four years was discussed in some detail by Dr. C. P. Botsford, Health Officer. The construction features of Connecticut swimming pools and the best methods of operation were also discussed. Emphasis was laid on the need for adequate supervision and analytical control of the swimming pool water. The sanitary code requirements were taken up at the round table discussion. A visit to the laboratories of the

State Department of Health was made in the afternoon.

After a general inspection of the laboratories, the interest centered largely on water analysis and the methods by which a sanitary water supply is maintained. For the benefit of those not familiar with the method, alkalinity of water and excess chlorine determinations were demonstrated. This was then repeated by a few of the visitors. This was an unusual opportunity to see the laboratories in operation, and it is hoped that other groups will avail themselves of the privilege.

A TRIBUTE TO MODERN MEDICAL SCIENCE

NOT very long ago in this community much was heard of the healing missions of Mr. Hickson. Since that time he has conducted missions in various parts of the world and has urged upon the Church what he regards as the duty of taking up Spiritual healing. He has expressed his views in a volume entitled "Heal the Sick."

An interesting review and criticism of the attitude of Mr. Hickson is contained in an address by the Bishop of Durham published in the *Hibbert Journal* for April 1925. The following is the conclusion of his address, a tribute to modern medical science.

"The Christian Ministry is not charged, and cannot wisely concern itself, with the healing of disease. That is the incommunicable task of the physician. Does it follow that there is no sphere for the coöperation of the doctor and the clergyman in the ministry of healing? None better know than the doctors that there are limits which their skill cannot overpass. The troubled conscience may have its influence, indirect, even unsuspected, but none the less potent, upon the patient's power to benefit from their efforts. And the sphere of conscience is pre-eminently the sphere within which the clergyman's duty is unquestionable. Shakespeare in *Macbeth* seems to have had in his thought the impotence of medical science. He describes the cure of incurable disease by the King's touch:

"How he solicits heaven

Himself best knows; but strangely-visited people,
All swoll'n and ulcerous, pitiful to the eye,
The mere despair of surgery, he cures;
Hanging a golden stamp about their necks,
Put on with holy prayers."

"Then he pictures a doctor confessing his powerlessness to respond to the pathetic appeal:

"'Canst thou not minister to a mind diseas'd,
Pluck from the memory a rooted sorrow,
Raze out the written troubles of the brain,
And with some sweet oblivious antidote
Cleanse the stuff'd bosom of that perilous stuff
Which weighs upon the heart?'"

"The medical science of the sixteenth century was helpless before the problem thus pathetically stated. We are in happier case. At least the modern physician can discern the nature of the psychic trouble which arrests and defeats physical treatment, and it may well happen that his knowledge may lead him to desire the clergyman's distinctive service."

"Mr. Hickson, in his enthusiasm for 'Spiritual Healing,' is led to use language which implies that the cessation of a healing ministry in the Church has been calamitous to mankind. Moved by a generous sympathy with human ills, and startled by the pageant of physical misery unfolding itself in the afflicted crowds which come to his Missions for relief, he imagines that modern Christendom is worse placed than ancient Palestine in the matter of healing facilities. He denounces the Church even fiercely for leaving unused a healing gift which might purge the world of its pain. It was, he says, 'a day of calamity for suffering humanity' when the Church abandoned the ministry of healing. But he is mistaken. No contrast between the present and the past is more extreme than that which leaps to the eyes when the medical resources of our time are compared with those existing in all former ages. I need not elaborate a statement which none will challenge. The remarkable decline in the death-rate is the achievement of Science applied intelligently to life, not the triumph of a wonder-working Church. When miracles of healing were most numerous, public health was least satisfactory. It is, however, important to remember that the wonderful advance of medical and surgical science, which is the glory of modern Christendom, has been conditioned throughout by its hardly-won independence of theological pre-suppositions and ecclesiastical control. Surely the Healing Ministry of Christ is to be traced, not in the sporadic prodigies of faith-healing, which at best gave results few and uncertain—even at Lourdes the cures are less than 5 per cent.—but in the majestic and unfaltering movement of Medical Science out of its confusing associations with magic and rudimentary religion into its present altitude, when it challenges with waxing confidence every malady which afflicts mankind, and brings its comfort on the wings of Christian charity to the poorest and most necessitous of the sick. It cannot be the duty of the Church deliberately to return to the beliefs and methods of a primitive and superstitious past. Rather should the disciples of the Truth Incarnate follow the evident leading of the Spirit of Truth, support the patient labours of scientific men, welcome and apply the knowledge which they gain, and thus, in humble obedience to the Creator's Laws, rescue Humanity, so far as may be possible, from the physical distresses which shadow its earthly lot."

HERBERT DUNELM.

GERMANY BARS AMERICAN PHYSICIANS FROM CLINICS

Berlin, Dec. 19.—American physicians have been informed by the medical faculty of the University of Berlin that until German representatives are again admitted to all international scientific associations the Americans cannot be admitted to the clinics. This contrasts with the German attitude on science. Expecting the reinstatement of the Germans in international scientific circles, they are taking the initiative in restoring good relations by reviving the exchange of professors. The professor of English and philology at Heidelberg University has been invited by the University of California to lecture there, Berkeley sending Professor J. H. Montgomery in exchange. Professor Carl Brinkmann, a national economist, has been invited to lecture at Yale.—*Boston Transcript*.

REVISION OF EDUCATIONAL METHODS IN THE YALE SCHOOL OF MEDICINE

A THOROUGHGOING revision of its educational methods with a view to placing less emphasis on routine class work and more on independent thought and research is planned by the Yale School of Medicine, according to an announcement made by Dean Milton C. Winternitz.

The faculty is considering the abolition of the year system of study and the resultant division of the student body into classes. This program will also involve the abolition of the system of examinations at the end of the different courses. The student will be allowed to select the sequence of his studies in the subjects which at present comprise the first two years of the medical curriculum, and then after qualifying for the clinical subjects, he will again be allowed liberty of choice. Their arrangement and his completion of them in any period of time will be largely a matter of his choice and ability. Admission to a course will depend on his fitness for the work as determined by the instructor in charge of it. This is the reverse of the present practice. A teacher now has no voice in determining what students shall enter his classes. He determines only whether they shall proceed into other classes. Thus, the student often thinks only of the examination which he is to take at the end of the year, and misses the application of the knowledge he is being offered.

Dean Winternitz made the following statement regarding the plan:

These changes may seem radical but they are in accord with adopted systems of graduate education, and medical education is graduate education.

There must, of course, be some check on the students' accomplishments; group examinations, as well as the graduating thesis, will serve this purpose. For the convenience of the faculty

such examinations may be given at fixed times, but within reasonable limits the student may determine when he will present himself for such a test.

Aside from other advantages, such a system will be equally valuable to the student who acquires knowledge rapidly and to his slower colleague. It is hoped that by the elimination of the class system, the pupil who acquires knowledge less rapidly will be less reluctant to spend more time in preparation, while the more brilliant scholar will be more willing to spend longer periods in investigation and specialization.—*Science*.

A TRIBUTE TO DR. CHARLES M. GREEN

On December 18, 1925, in Harvard Hall at the Harvard Club of Boston, assembled two hundred and fifty members of the medical profession to do honor to Doctor Charles M. Green on his 75th birthday. Doctor Frederick C. Shattuck of Boston was toastmaster and introduced as speakers:

Dr. Joseph B. DeLee of Chicago.
Dr. Emilius C. Dudley of Chicago.
Dr. John M. T. Finney of Baltimore.
Dr. Barton C. Hirst of Philadelphia.
Prof. Charles H. Grandgent of Cambridge.
Dr. George W. Kosmak of New York.
Prof. Henry Pennypacker of Cambridge.
Dr. John O. Polak of New York.

THE RIGHT OF ESSEX COUNTY TO TAX NEWBURYPORT FOR THE SUPPORT AND MAINTENANCE OF THE MIDDLETON HOSPITAL

THE Supreme Court of Massachusetts has handed down a decision upholding the verdict of \$22,934.90 against the City of Newburyport brought by Essex County in its effort to compel this City to contribute its share of the expense involved in the creation of the Hospital at Middleton for the treatment of cases of tuberculosis.

This sum was awarded by the jury in the action brought by the County. The Hospital cost \$1,569,287. There has been considerable feeling throughout the County that this Hospital was unduly elaborate and therefore costly. It was built because of the state law which required counties to provide an institution for the treatment of tuberculosis. The City of Newburyport set up the argument that it had arranged with a local hospital for the care of its tuberculosis cases and therefore should not be required to contribute to the expenses of the Middleton institution.

The County commissioners have been severely criticised on various occasions for the very great expense incurred in the erection of building and laying out the grounds. The decision of the

Supreme Court has ended the controversy but judging from the past there will probably remain some bitter feeling in several parts of the County.

EXTRACTS FROM "A SUMMER WITH THE LEAGUE OF NATIONS"

AN ADDRESS AT PHILLIPS BROOKS HOUSE,
NOVEMBER 8, 1925, BY PROF. MANLEY O. HUDSON OF THE HARVARD LAW SCHOOL

THE HEALTH COMMITTEE

It may not be realized in some quarters how this money is expended, and perhaps I can best describe it by referring briefly to the activities of various commissions which are now maintained by the League. I shall first mention the permanent Health Committee, for in all of the international coöperation which proceeds today I think there is more romance, more tangible progress, and more hope for the future in the field of health than in any other field. Fortunately coöperation in this field is not limited to the members of the League. Germany, the United States, and even Russia have a big part in it. The Health Committee is now meeting in Geneva with Surgeon-General Cumming of Washington and Professor Alice Hamilton of the Harvard Medical School sitting as members of the Committee. I was thrilled during the summer to hear of the aid that has been given by the Health Committee to the health authorities of Yugoslavia, and of the splendid progress which has been made in that country since the War. I doubt if any country has made greater progress in public health work during recent years than Yugoslavia, and Dr. A. Stampar, who is largely responsible for the work there, ranks today as one of the great statesmen of Europe. The Health Committee of the League has proceeded now for several years with the interchanges of public health personnel financed by the Rockefeller Foundation. About 400 public health officials from fifty different countries have participated in the interchanges, and, if they can continue for a quarter of a century, the whole world will begin to speak the same language of public health administration. Almost as significant is the Epidemiological Intelligence Service organized by the Health Committee. This Service has recently been much improved by the establishment of an Epidemiological base at Singapore, from which reports concerning epidemics in the Far East are wireless to Geneva once a week, and there they are published in the regular bulletin which carries all over the world the facts about epidemics everywhere.

In mid-summer a meeting was held of the Advisory Committee on the Traffic in Opium and Dangerous Drugs. I found the feeling quite general that a great advance had been registered by the new treaty drawn up by the

Opium Conference last winter. This treaty has now been signed by a number of states, and I think it is quite unfortunate that the withdrawal of the American delegation from the conference has made it difficult for progress to be made with reference to the acceptance of this treaty by America.—*Harvard Alumni Bulletin*.

FILES ETHER MEASURE

REPRESENTATIVE BURT DEWAR of Malden has filed a bill with the clerk of the House, on petition of Ray H. Shattuck, a Malden physician, which would include in the practice of medicine the administration of ether, chloroform, nitrous oxide or other substances producing unconsciousness. Under the bill it would be necessary to have a physician, or a registered dentist, to administer these substances.

THE GORGAS MEMORIAL INSTITUTE

THE annual meeting of the Board of Directors of the Gorgas Memorial Institute of Tropical and Preventive Medicine held in the Pan-American Union, Washington, D. C., at 2:00 P. M., Friday, October 23, 1923, was opened by the following message from President Calvin Coolidge, Honorary President of the Institute:

"I am very glad to hear of the encouraging progress of the Memorial program. Human misery and the enormous economic loss caused by preventable illness are matters of serious moment to every individual. The Gorgas Memorial's plan to conserve this needless waste of human resources is commendatory and deserving of the support of all thinking people."

At this meeting Dr. Franklin Martin was elected acting President, and the following elected to the Board of Directors: William Green, President, American Federation of Labor; John R. McQuigg, National Commander, American Legion; John W. O'Leary, President, United States Chamber of Commerce; Mrs. William D. Sherman, President, Federation of Women's Clubs; Dr. William D. Haggard, President, American Medical Association; Dr. Alfred Stengel, President, American College of Physicians; Dr. Rudolph Matas, President, American College of Surgeons; Professor C. E. A. Winslow, President, American Public Health Association; Dr. Stewart Roberts, Atlanta, Ga.; Surgeon General Merritte W. Ireland, U. S. A.; Surgeon General Hugh S. Cumming, U. S. P. H. S.; Rear Admiral Edward R. Stitt, U. S. N.; Charles H. Thorne, Chicago; Dr. A. S. Lobbinger, Los Angeles; James Brown, Louisville, Ky.; Dr. E. W. Ryerson, Chicago.

A report of activities to date was read by Dr. Franklin Martin, which in substance is as follows:

"For the past two years our efforts have been directed towards interesting the representative members of the medical profession and certain influential laymen in the Gorgas program. Through correspondence and personal solicitation, we have succeeded in enrolling nearly 2,000 physicians and laymen on our State Governing Committees. Each state has its nucleus of progressive individuals enthusiastically working to bring the Gorgas program to a successful issue, each one of whom has testified to his faith in the movement by subscribing not less than \$100 to it.

"Gradually the Gorgas Idea is becoming better known throughout the country—and along with this knowledge is developing a keen public interest in this coöperative medical and lay effort to improve the health of the individual which ultimately means longer and better life, greater earning capacity and broader opportunity. It appeals not alone to the humanitarian but to the economic instinct.

"The Gorgas program consists of two phases, viz: the work in tropical research; and, an educational campaign to develop coöperation between scientific medicine and the laity, to the end that personal health standards may be improved and preventable illness and premature death avoided."

The Gorgas Memorial purposes to make 1926 Health Conservation Year, during which an intensive campaign through the newspapers, magazines, radio, moving pictures, clubs and other gatherings will be conducted to promote an interest in better personal health. Every citizen in the United States will be urged to set aside one day during the year—preferably his birthday—to go to his personal physician and have a health examination.

A national mosquito abatement campaign will be conducted, in which the public will be urged to coöperate with all health agencies in eradicating disease carrying and pestiferous mosquitoes.

Arrangements are being negotiated to begin the tropical research program during 1926. The work will be conducted in laboratories, the use of which has been tendered the Institute, pending the construction of its own building.

Coöperation between the public and scientific medicine will be encouraged, and a public opinion receptive to proper health instruction developed.

Organization of State Governing Committees will be steadily extended and every effort put forth to complete the Committee membership quotas as rapidly as possible. Our present members are asked to aid in this direction by interesting their associates and other representative medical and laymen and women in the Memorial, and urging them to enroll in the State Governing Committee.

MIDDLE CLASS CANNOT AFFORD SICKNESS

WHAT should a doctor charge his patient? This question was brought up by Michael M. Davis of the United Hospital Fund of New York at the recent meeting of the American Association for the Advancement of Science. Since the advent of the specialist, the increase in the importance of the laboratory analysis, X-rays and therapeutic service, radical changes have come about in medical fees, Dr. Davis said. In the old days when most physicians did practically the same work, the fees charged were, so to speak, fixed by custom and were fairly uniform. At present fees in cities, and to a less extent in the country, vary from \$1.00 a visit to the office of a country practitioner, to \$10 000 for a major operation by a surgeon of national reputation. There are other costs for laboratory and X-ray tests, nursing, and hospital charges.

Over a fourth of the entire medical profession gives a portion of its time free to hospitals and charitable institutions and clinics. These are usually the best trained and best known doctors and their charges to the paying patients are probably increased in proportion to the amount of time they give away, Dr. Davis said. Studies of family incomes show that the average middle class person can never afford to have any but very minor illnesses if well trained physicians and most approved form of diagnosis and treatment are secured. Important adjustments will have to be made in the future to fit the fee to the average pocketbook, and to pay the doctor at the same time. Mr. Davis' report showed.—*Boston Transcript*.

LIQUOR KILLS 78 IN MONTH

STATE ALCOHOLISM DEATHS FOR OCTOBER CALLED THE AVERAGE

ALBANY, N. Y., Dec. 14 (A. P.)—Seventy-eight persons died of alcoholism in New York State in October, the New York State Department of Health announced today.

The number is the exact monthly average for alcoholic deaths in the period between 1907 and 1915, and, according to the Health Department, "almost double the number of lives destroyed in our perennial crime wave during the same month and greater than the combined mortality from measles, scarlet fever and diphtheria."

Statistics of the department indicate that since January 1, 1925, there have been 534 deaths from alcoholism in the State, compared with 505 deaths in the corresponding period in 1924, and with 90 deaths for the first ten months of 1920.—*N. Y. Times*.

DR. DAVID CHEEVER GIVEN LEAVE OF ABSENCE

DR. DAVID CHEEVER has been given a sabbatical leave of absence from the Harvard Medical School and the Peter Bent Brigham Hospital for the second half of the school year. He will devote this time to rest and travel going first to California.

RECENT DEATH

RANDALL.—DR. CLIFFORD WALCOTT RANDALL, a Fellow of the Massachusetts Medical Society, died at the Worcester City Hospital, December 27, 1925, at the age of 65.

Dr. Randall was born in Oxford, the son of William Foster and Hannah (Baker) Randall. He was educated in the public schools of Brockton and Millbury and was graduated from the Millbury High School and from the Medical Department of the University of Pennsylvania in 1897, settling in Worcester in that year and joining the State medical society. He had practised in that city since. He was a member of Freedom Lodge, K. of P.

NOTICE

TO MASSACHUSETTS PHYSICIANS

The State Department of Public Health is now supplying the following stations with scarlet fever streptococcus antitoxin:

Lawrence Health Department.
Worcester Health Department.
Contagious Hospital, Fall River.
Mercy Hospital, Springfield.
New Bedford Board of Health.
Cape Cod Health Bureau, Hyannis (Dr. A. P. Goff).
Greenfield Board of Health.
North Adams Board of Health.

Physicians can obtain this product without charge from any of the stations by day or night.

As soon as a larger supply of scarlet fever streptococcus antitoxin is available other stations will be designated. As previously announced, this antitoxin can be obtained at the Boston City Health Department, City Hall Annex; at Room 527, State House (telephone Haymarket 4600, Line 38); or at the Antitoxin and Vaccine Laboratory, 375 South Street, Jamaica Plain (telephone Jamaica 4127).

Yours truly,

GEORGE H. BIGELOW, M.D.,
Commissioner of Public Health.

CORRESPONDENCE

MEDICAL LIBERTY LEAGUES, VACCINATION, TUBERCULIN, SCHICK TESTS AND OTHER MATTERS

Mr. Editor:

At last we have almost gone over the top. The *Health Bulletin of the League of Nations* credits us with more smallpox than any other country in the world, bar one. In other words, we stand second in the number of cases reported to health authorities during 1924. This disgraceful condition of affairs is largely due to the activities of the American Medical Liberty League, a nation-wide organization

with objects identical, so far as I can ascertain, with those of our own Medical Liberty League, of which Mr. H. D. Nunn is the great protagonist. According to the *Journal of the American Medical Association*, the American Medical Liberty League was formed in 1918 and its organ, the *Truth-teller*, is published by the Truth-teller Publishing Company at 38 North Division Street, Battle Creek, Michigan. Its first president was Charles M. Higgins of Brooklyn, New York, author of the pamphlet *Restore the coroners*. Check dangerous medical domination, protect public life and safety. Its first Vice-President was Eli G. Jones, M.D., of Buffalo, N. Y., who in circulars offers to teach physicians how to cure cancer (claiming that 80 per cent. of all cases can be cured by his method) and who gives as reference Dr. C. S. Carr of Columbus, Ohio, the advertising expert of Peruña. Dr. Jones (says the *Truth-teller*) has at various times practiced allopathic, homeopathic, eclectic, physiomedical and biochemical medicine. (An all-round practitioner I' faith.) The Treasurer was or is D. W. Ensign, Managing Editor of the *Truth-teller*. The other directors were or are J. H. Grier, J. W. Griggs and W. E. Ensign. Of Griggs I know nothing. Dr. Grier has published a book, "The Physician in the Home," and says: "Get a copy, study it carefully, apply it exactly and watch your pains and aches vanish away like an ugly dream at dawn." The Third Director, W. S. Ensign, Phys. and Pat. Ch. (whatever that may mean), of Battle Creek, does a mail order business in Ensign Remedies. (A number of these have been analyzed by Michigan State officials and in the official bulletin appear under the head of "fakes and frauds.") The company issues a book listing diseases and their cures. These are arranged alphabetically from Abdomen, Abortion, and Abscesses, down through Eczema, Irritability, and Itch, to Worms, Wrinkles, and Writer's Cramp. For peritonitis you take 748 a and b, for appendicitis 758 a and b. (The Michigan authorities say that this remedy contains 100 per cent. of sugar.) If you think you have cataract take 504 a and b. For lock-jaw 24 is a specific, as is 1019 a and b for housemaid's knee. Are you troubled with bashfulness? You need 186 a and b; but be careful here, for 187 is to be used if you "see animals and reptiles." One hundred and eighty-nine cures dullness and stupidity, and 192 is recommended for disappointment in love. Two Ensigns, W. S. and D. W., in the directorate, and three, W. S., D. W. and T. D., connected with the *Truth-teller*, suggest to the suspicious mind that the American Medical Liberty League is not altogether free from some slight connection with the Ensign Remedies Company of Battle Creek, Michigan. From the A. M. L. L. pours a flood of literature in the form of leaflets, pamphlets and postal cards, and let no one think, absurd as they seem, that they are without influence on the lay and the legislative mind, or that if we are to keep our supremacy as a well vaccinated community that we can long do it if we simply lie on our oars and patiently await what is patently coming to us as it has already come to the majority of communities from Canada to Mexico. These leaflets attack not only vaccination but also anti-typhoid inoculation, the use of toxin antitoxin, the testing of cattle with tuberculin, the employment of school nurses, the disinfection of the eyes of the new-born babe, the use of chlorine in drinking water, the registration of physicians, the isolation of contagious diseases, the existence of closed hospitals, the official "lawlessness" of Boards of Health, and other things too numerous to mention. It is intolerable in a free country, says form 67 (\$2 per 1000), that medical dogma should command the police power to put into your eyes as an infant a caustic solution when cleanliness is all that is needed; invade your schoolroom; examine your body and urge medical and surgical treatment; compel you to bare your arm and take a shot of bovine syphilis, alias calf pus;

compel you to drink chlorinated water (water drugged with bleaching powder); force you to have your cow injected with a disease product; forbid you to remain in your own home when sick and needing its shelter and protection more than at any other time in life; take your money in taxes to propagate the ideas and carry on the medical tyrannies here enumerated and others, and so on and so forth. Form 79, an attack on Dr. Bundesen and the Chicago Board of Health, speaks of health gangsters, spies, meddlers, and child stealers. Form 71 (30 cents per 100) speaks of strutting and preening political medicos who squirt a caustic solution into infants' eyes, send their emissaries disguised as nurses into your very homes with the view of harassing you into obedience to their damnable dictates; imprison healthy adults on the pretense that they are germ carriers, in order to bolster up a blown-up theory of disease; placard your house as venerably (sic) infected when it's a false and damnable libel; forcibly punch bovine syphilis into the pure blood streams of you and your children under the exploded theory of immunizing you against smallpox; squirt into you and your children poisoned blood called serum drawn from disgustingly diseased horses, and do all these things purely for the dirty drachmas there are in it. This brochure with its heading "Pus Punching Thuggery" speaks of pus punching freebooters of St. Louis humorously yelet Health Officers who Jesse James incoming railroad passengers from the South for the purpose of forcibly infecting them with pus drawn from disgustingly diseased animals, calling the orgy compulsory vaccination but in reality lawless highbribery. From other leaflets you learn that sore throat, diphtheria, measles, mumps, tuberculosis, meningitis and cancer follow vaccination as sheep follow the bell wether. Senator Money has known of children and adults infected with foot and mouth disease as a result of this practice. You learn that vaccination and vaccination alone keeps smallpox alive, that it is an infamous crime, a beastly outrage, the supreme folly of the medical profession, a gigantic delusion, a great humbug, that health boards get a rake-off from the vaccine manufacturers and advocate it for this reason, and this reason only, that Jenner was a self-deluded quack, that a gentleman in San Francisco vaccinated six persons on one farm and by so doing infected five of them with diphtheria and caused the death of three of the six from tuberculosis, that the nation will crumble if there be not a lessening in the amount of vaccines and of serums, that the wholesale pollution has already brought about nervous instability, lack of tone, vascular irregularities, and what else could happen but growths, cancers and heart failure? We are perhaps surprised to learn that vaccination violates God's law, being a five-fold animal and human poison introduced into the very center thus otherwise guarded by nature in the providence of God, and that the Ven. Archdeacon Colby considers that "it mingles in a hideous communion of blood all the diseases and taints of the community." "Every hereditary sewer is made to open up in the nursery; it pours every disease and sifts every lust and ventilates every uncleanness throughout the fragile bodies of our little children," and we, the believers, are told from Terre Haute that one of the most difficult things on earth to understand is the bigoted, intolerant, fanatical, unreasoning attitude of the average advocate of vaccination, that it is the same spirit that burned and hung witches, that bored holes with red hot irons in the tongues and ears of Quakers, that banished Roger Williams for the eternal salvation of human souls, a redivivus of the Plymouth Rock variety. Danl. 5-25 (And this is the writing that was written "Mene, Mene, Tekel, Upharsin.") Witches, Quakers, Roger Williams and Plymouth Rock seem to suggest Massachusetts, and it is here in Massachusetts that we find William Lloyd Garrison, Jr., arguing that because we have

but little smallpox we therefore need little vaccination, advancing also the theory that the question is not whether vaccination is or is not of use, but that it is part of the age long struggle between the materialistic and the spiritualistic view of life. It is here that Mr. H. D. Nunn throws himself heart and soul into the work of proving that compulsory vaccination is a mistake (any vaccination being a useless and even dangerous procedure) and that everyone should decide this matter for himself, that unbelievers should be let alone and their children remain unprotected. It is in Massachusetts that the Medical Liberty League, well supplied with funds, comes yearly before the Legislature in an effort to cause the repeal of the only law still standing between us and the advent of smallpox—I. e., the compulsory vaccination of the children in the public schools. It is manifestly our business to convince all sensible persons, including and in particular members of the Legislature, that these views are wrong, that our vaccination laws should be at least as strong as are those of New York, New Hampshire and Rhode Island, that we cannot afford to lift the gates and allow Massachusetts to sink to the level of the rest of the United States, in some ways the most smallpox ridden country in the whole world, bar none.

Mr. Nunn wishes it distinctly understood that the American Medical Liberty League and the Medical Liberty League, Inc., are separate unaffiliated organizations. They have identical objectives; they seem to have been organized in the same year; certain people are officers of both organizations. So far as I know, these are the only points of contact.

SAMUEL B. WOODWARD.

FROM THE MASSACHUSETTS COLLEGE OF OSTEOPATHY

Editor, Boston Medical and Surgical Journal:

Your statement under the heading of "Legislative Notes" in the *Boston Medical and Surgical Journal*, October 22, 1925, page 797, strikes me with surprise. Usually a carefully prepared article by the unprejudiced officers of an honorable society is accurate, and devoid of such errors as might tend to lessen the esteem in which a school and rival profession are held by the public. But, in the present instance, certain statements are made which even those quite unfamiliar with medical legislative affairs know to be far from the truth.

Your statement

"At a time when the Eclectic Society had become very small and the Osteopaths were moving for a separate Board of Examiners, an Osteopath was substituted on the Board for a member of the Eclectic Society,"

cannot be reconciled with the fact that the Osteopath, Dr. Matthew T. Mayes of Springfield, sat on the Board for years with Dr. Augustus L. Chase, the Eclectic representative. What really happened was that the Osteopaths were able to show that the diminishing number of Homeopaths were over-represented on the Board, and Dr. Mayes took the place of a Homeopath.

This disintegration of the Homeopathic profession by the process of absorption within the Massachusetts Medical Society is made quite evident by your statement on page 799.

"The membership of the Massachusetts Homeopathic Medical Society is about 400 and of these a majority are also members of the Massachusetts Medical Society."

While expressing regret for the rapid decrease in the number of Homeopathic physicians, which, according to your statement, is now less than two hundred, yet your article again calls attention to the unfairness of the Homeopathic representation on the State Board of Examiners. Now that the Osteopaths

are so numerous, and with their examination fees pay such a large proportion of the expenses of the department, and as their high standing is vouched for by your statement

"As a matter of fact the Secretary of the Board at the present time is an Osteopath and he is elected by the Board itself,"

there is every reason in the world for increasing the number of Osteopathic examiners on the Board at the expense of the Homeopathic representatives. This should be very easy, since you say:

"We do not either favor or oppose the appointment of Osteopaths on the Board."

With the true facts and figures presented before a legislative committee, and without the opposition of the Massachusetts Medical Society, I believe we shall soon see a more equitable and just alignment in the composition of the Board of Registration in Medicine.

There is another phase of the matter which, however, is of more serious importance. I have read your article several times. I have had others, both lay and professional, read it. We all have been unable to come to any other conclusion than that you have deliberately tried to defame the Massachusetts College of Osteopathy by associating it and its graduates with low grade medical schools, and medical schools under indictment for fraud. Immediately after mentioning the Massachusetts College of Osteopathy, you say:

"We do not ask or seek the destruction of these schools,"

apparently meaning by implication that there is a question of the advisability of the destruction of the Massachusetts College of Osteopathy.

There is, however, an even more serious matter. You tabulate this college under a specific heading as follows:

"Total Number of Physicians Examined, Registered and Rejected by the Board of Registration in Medicine from 1911-1924."

	Exam-ined	Regis-tered	Re-jected	Per cent.
"Massachusetts College of Osteopathy	303	129	174	57.4

Our records show that between the years mentioned this school graduated only 230, of which number 60 never applied for examination in Massachusetts, as they settled in practice in other States and in foreign countries. This leaves only 170 who could have taken the examination, as opposed to your figures of 303. The motive for the dissemination of such a libelous misstatement I have no doubt you would be unwilling to divulge.

At the present time, I am quite sure that every living graduate of the Massachusetts College of Osteopathy, between the years 1898 and 1924, has complied with the laws of the various States and countries and is practicing his chosen profession. Yet you are moulding public opinion to believe that over 50 per cent. (to be exact, 57.4 per cent.) of our students after four years of study and graduation are obliged to seek employment in some other line of endeavor than the profession of Osteopathy. Your statement to this effect is as follows:

"We are just as anxious as anyone that the poor boy should have a chance to study medicine, but we are also anxious that the poor boy should not waste his time and money in securing an education which is inadequate to enable him to secure the right to practice his chosen profession."

Your article cannot but have an injurious influence. If not upon this school, yet there can be no question of its damaging effect upon the prestige and

practice of our graduates, which will be a matter for the alumnal association to consider.

I cannot but believe that an uncorrected article so untrustworthy as yours will do more to defeat your efforts to secure monopolistic medical legislation than any opposition we could present.

For your own protection, rather than from an inherent desire to do right, I trust you will publish this letter in its entirety.

Yours very truly,

J. OLIVER SARTWELL, D.O., Dean.

COMMENT

We are glad to accede to the wishes of the writer of the letter which appears above. Previous to the appointment of Dr. Mayes to membership on the Board of Registration the Board consisted of three representatives of the Massachusetts Medical Society, two of the Massachusetts Homeopathic Medical Society, and two of the Eclectic Medical Society. The representatives of the Eclectic Society were Dr. Miles and Dr. Chase. After Dr. Miles, the Eclectic, resigned, Dr. Mayes, representing the Osteopathic practitioners, was appointed. This statement is verified by the appended letter signed by the Secretary of the Board, who has kindly given the figures which show the exact status of applicants who appeared as graduates of the Osteopathic School. If there is any real discrepancy it is due to the manner of recording the applicants from the Osteopathic School. The original figures have been compared with the statements in the annual reports of the Board of Registration covering the years referred to and found to correspond with the statement previously published. The custom at that time was to record new applicants whenever a new application for examination was filed. The law required a new application after an applicant had exhausted his privileges under any given application.

This accounts for any duplication of figures. It does not, however, indicate any favorable feature of the instruction given by the Osteopathic School in question, for if a graduate of this school failed repeatedly, it shows that either the applicant was not well prepared to study medicine or the instruction given was not adequate to fit him for the test required by law. EDITOR.

The Commonwealth of Massachusetts
Department of Civil Service and Registration
State House, Boston

Editor, Boston Medical and Surgical Journal:

In reply to your letter of December 11, I have to say that in going over the records of the graduates of the Massachusetts College of Osteopathy between 1911 and 1924, I find 79 were registered on first examination, 50 on subsequent examination and 50 who never passed, although I think that there are some who subsequently entered other schools and were graduated and later secured registration.

The number of "repeaters" is 77. These figures have not been rechecked, but I think are substantially correct.

The records show that Dr. C. Edwin Miles resigned from the Board in 1908 and the Board record book under annual meeting of July 14, 1908, makes record in regard to Dr. Mayes as follows:

"Dr. Matthew T. Mayes was present as newly appointed member to fill vacancy caused by resignation of Dr. C. Edwin Miles." At that time Dr. Samuel H. Calderwood and Dr. Nathaniel R. Perkins were representatives of the Board from the Homeopathic Society.

Dr. Miles was an Eclectic practitioner and Dr. Mayes was the first Osteopath to serve on the Board—

which left the personnel of the Board with one Eclectic, Dr. Augustus L. Chase, and the new member, Dr. Mayes, as an Osteopath.

We have no way of ascertaining how many Osteopaths are now practicing in Massachusetts. I should estimate there are around two or three hundred—although there may be more.

Yours very truly,

DR. FRANK M. VAUGHAN, Secretary.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

CASES AND DEATHS REPORTED FOR THE WEEK ENDING JANUARY 2, 1926

Anterior poliomyelitis	4	Ophthalmia neonatorum	20
Chickenpox	224	Pneumonia, lobar	218
Diphtheria	115	Scarlet fever	314
Dog-bite requiring anti-rabic treatment	10	Septic sore throat	2
Encephalitis lethargica	2	Syphilis	40
Epidemic cerebrospinal meningitis	3	Suppurative conjunctivitis	13
German measles	39	Trachoma	2
Gono rhea	98	Tuberculosis, pulmonary	99
Influenza	7	Tuberculosis, other forms	13
Measles	1,408	Tuberculosis, hilum	23
Mumps	57	Typhoid fever	10
		Whooping cough	292

CONNECTICUT STATE DEPARTMENT OF HEALTH

MORBIDITY REPORT FOR THE WEEK ENDING JANUARY 2, 1926

Diphtheria	40	Influenza	10
Last week	24	Mumps	6
Whooping cough	53	Paratyphoid fever	1
Last week	31	Pneumonia, lobar	45
Scarlet fever	68	Septic sore throat	2
Last week	56	Trachoma	1
Measles	283	Tuberculosis, pulmonary	19
Last week	180	Tuberculosis, other forms	1
Bronchopneumonia	56	Chancroid	1
Cerebrospinal meningitis	2	Gonorrhea	41
Chickenpox	94	Syphilis	36
Encephalitis epidemic	1		
German measles	5		

NEWS ITEMS

DR. CHARLES MAYO has been made an officer of the Legion of Honor by the French government.—*Science.*

AMERICAN SOCIETY FOR THE CONTROL OF CANCER TO HOLD AN INTERNATIONAL MEETING OF CANCER EXPERTS—Announcement is made that a meeting of about one hundred of the most eminent cancer experts of Europe and America will be held in the United States next September under the auspices of the American Society for the Control of Cancer.

About twenty of the foremost surgeons, radiologists and research workers in England, France, Switzerland, Belgium and Holland will be invited to come to America and spend four days in formal and informal discussion of the problem of cancer control.

The gathering will take account of the latest information on the practical phases of the cancer problem and, by formulating concisely and in simple language the fundamental groundwork of fact and opinion upon which qualified students of cancer agree, give substantial aid to the great collective effort which is being made for the control of this disease. The subjects discussed will include the importance of early diagnosis and the employment of prompt and capable treatment; surgery, irradiation, hospitalization, statistics, public education, publicity and quackery.

The focusing and registering of the best obtainable medical opinion of Europe and America upon a great practical problem such as the suppression of the scourge of cancer is certain to be of great value in the movement for cancer control in the United States and in other countries.

HEALTH SURVEY, BALTIMORE—Health officials of Baltimore are just completing a health survey of the entire city, with the idea of increasing the branch of the service most needed in each section. Where the infant mortality rate is found to be high baby clinics will be opened, where the tuberculosis death rate is high new tuberculosis clinics will be established, and where a high general death rate is discovered all the health forces of the city will be concentrated.—*United States Children's Bureau.*

PSYCHIATRIC CLINIC, EVANSTON, ILL.—Northwestern University will supervise a free clinic for cases of mental deficiency and emotional or behavior disorders. The clinic is intended for use of the public schools, hospitals, city police department, and social service agencies.—*United States Children's Bureau.*

NOTICES

UNITED STATES CIVIL SERVICE EXAMINATION

The United States Civil Service Commission announces the following open competitive examination:

Dietitian

Applications for dietitian will be rated as received until June 30, 1926. The examination is to fill vacancies under the Public Health Service and the Veterans' Bureau throughout the United States.

In the Public Health Service the entrance salary has been tentatively established at \$1020 a year, with quarters, subsistence, and laundry. Advancement in pay may be made without change in assignment up to \$1800 a year, with quarters, subsistence, and laundry.

In the Veterans' Bureau the entrance salary is \$1650 a year. Advancement in pay may be made without change in assignment up to \$2500 a year. In this Bureau when quarters, subsistence, and laundry are available, a deduction of \$600 a year will be made to cover same.

Full information and application blanks may be obtained from the United States Civil Service Commission, Washington, D. C., or the secretary of the board of United States Civil Service Examiners at the postoffice or custom house, any city.

DR. GEORGE E. VINCENT is to deliver the Cutter Lecture on Preventive Medicine on February 11, 1926, at the Harvard Medical School Amphitheater. Dr. Vincent is President of the Rockefeller Foundation.

REPORTS AND NOTICES OF MEETINGS

BOSTON MEDICAL HISTORY CLUB

The next meeting will be held at the Boston Medical Library, 8 The Fenway, Monday, January 18, 1926, at 8:15 o'clock. "Medical New England in 1650." Dr. Malcolm Storer. "Some Unpublished Notes of Dr. Nathan Smith." Dr. C. C. Stewart. Light refreshments after the meeting.

HENRY R. VIETS, M.D.,
Secretary.

THE WEST END NEIGHBORHOOD CONFERENCE

The regular meeting of the West End Neighborhood Conference will be held in the Health Unit, 17 Blossom Street, Friday, Jan. 15, 1926, at 3:30 P. M. sharp.

A round table discussion of the needs of a Municipal building and the development of an interest in that direction will be taken up.

Mr. John I. Fitzgerald, Representative from the district, will lead in the discussion. Those who are urging the need of a building of this type in this district have in mind recreation, shower baths, gymnasium, possibly Health Unit services in combination with the other features. This matter is of interest and importance to every agency.

CHARLES F. WILINSKY, M. D.

BOSTON MEDICAL LIBRARY

FIFTIETH ANNIVERSARY

The Boston Medical Library, founded in August, 1875, having reached its fiftieth birthday, will celebrate the event on Tuesday evening, January 19, at half past 8 o'clock, in the large hall of the Library. The exercises will consist of a short account of the early days and the subsequent successful growth of the Library, to be followed by an address by Dr. George E. Vincent, President of the Rockefeller Foundation of New York.

There will be also an exhibition of books and pictures showing the different homes of the Library and portraits of the founders, officers and prominent members, as well as a collection of many of the valuable classics of medical literature in the Library's possession.

It should prove a noteworthy occasion in the life of one of Boston's most useful institutions.

INTER-STATE POST GRADUATE FOREIGN CLINIC ASSEMBLIES 1926

THE 1926 foreign clinic assemblies given under the direction of the Inter-State Post Graduate Assembly of North America will cover a terri-

tory including the chief clinic cities of Italy, Switzerland, Germany, Austria, Czecho-Slovakia, Holland and Belgium.

The physicians are going abroad as the result of invitations extended, through this Association, by the leading medical universities and institutions of the countries to be visited to the medical profession of North America.

The members of the party will sail from New York on April 28th, a few days after the meeting of the American Medical Association at Dallas, Texas, thus, giving the physicians of the party plenty of time to attend this meeting.

The large first-class cruising steamer, the "Araguaya" of the Royal Mail Steam Packet Line has been chartered to take the physicians abroad. The party will land at Cherbourg and will go at once to Paris where the clinic assemblies start.

Dr. Carl Beck of Chicago, the general secretary for the foreign assemblies is now in Europe completing the clinic arrangements for the assemblies. The clinic cities to be visited are as follows: Paris, Rome, Florence, Padua, Milan, Berne, Zurich, Munich, Vienna, Prague, Berlin, Amsterdam, The Hague, Utrecht, Leyden and Brussels. There will be extension assemblies held in all other principal medical centers of Europe following the main assemblies.

It is of interest to note that a large percent of the distinguished teachers, who will instruct the assemblies, speak the English language. However, there will be a director chosen from the teaching staff in each of the clinics, who will be able to speak good English in case the chiefs do not. It will be the duty of this director to present the history cases and to answer questions as an interpreter. This is one of the reasons why Dr. Beck is now in Europe.

The assemblies are open to members of the profession who are in good standing in their State or Provincial Society with no restriction to territory. This invitation is understood to be extended to the entire medical profession of North America.

Admittance to the clinics and privileges of the tour will be protected by the issuing of an admittance ticket or card. This rule will be strictly enforced in order to protect the Association in its membership requirements, which is, that a physician must be in good standing in his State or Provincial Society. We will not be responsible or admit physicians to privileges unless they are members of the group.

The members of the party will be limited to a number that can be accommodated comfortably in both the clinics and hotels. After careful consideration and consultation with the transportation department and the foreign clinics, this number has been fixed at five hundred, which includes members of the physicians' families. Necessarily this will limit the number of physicians to around three hundred.

Physicians may return home on three separate sailings during the main assemblies. First, at the end of the visit to Italy and Switzerland by way of Cherbourg; second, at the end of the visit to Holland from Rotterdam and third, at the end of the assembly in Brussels from the port of Antwerp.

It is necessary in order to hold space for the assemblies to send to the office of the Managing-Director, W. B. Peck, Freeport, Illinois, the sum of \$65.00 per person. If for any reason the applicant for space decides that he cannot attend the assemblies, the money will be refunded immediately, if this demand is made as early as six weeks before sailing time. A booklet of information pertaining to the assemblies and prices for same may be secured free of charge by writing the Managing-Director's office.

Ladies Entertainment: Besides the extensive sightseeing and travel features, arrangements are being made for a ladies' entertainment committee in each of the clinic cities. The committees will be composed of the wives of the clinicians and prominent citizens.

In offering the foreign clinic assemblies this Association has the hearty co-operation and assistance of the most distinguished teachers and clinicians in both North America and Europe. The organization in its endeavors hopes to combine with its success in post-graduate work a corresponding advancement in International good fellowship among the members of the medical profession of the different countries of the world.

The officers of the assemblies are: Dr. Charles H. Mayo, Chief Executive and General Chairman, Rochester, Minnesota. Dr. Carl Beck, General Secretary, Chicago, Illinois. Dr. William B. Peck, Managing-Director, Freeport, Illinois. Mr. Reeve Chipman, Manager of Transportation, Boston, Mass.

A second section of the assemblies for a limited number will be conducted during the summer months for those who are unable to take advantage of the April sailing. The members of the party will leave New York S. S. "Pittsburgh" on June 19th, return sailing, August 13th from Antwerp S. S. "Zeeland."

BERKSHIRE DISTRICT MEDICAL SOCIETY

THE Berkshire District Medical Society will hold a regular meeting Thursday, January 14, 1926, at the Wendell Hotel in Pittsfield, Mass. Dinner will be served promptly at 6.30 P. M.

James M. Montague, M.D., recently president of the American Proctological Society, will describe "Office Methods of Rectal Surgery." This will include treatment of hemorrhoids, fistulae, fissures, etc. His talk will be illustrated with motion pictures.

This will be a very valuable meeting as it will be strictly practical, explaining methods we may all use in our offices. All welcome.

MASSACHUSETTS GENERAL HOSPITAL CLINICAL MEETING

A CLINICAL meeting will be held on Thursday evening, January 21, at 8:15 in the Moseley Building.

Program—1. Demonstration of Cases. 2. Modern Problems of Industrial Medicine.—Dr. David Edsall and Dr. Alice Hamilton.

Doctors, medical students and nurses are cordially invited.

THE PHYSIOLOGICAL CONFERENCE

THE next meeting of the Physiological Conferences will be held in the Bowditch Library of Harvard Medical School on Monday, January 18, at 4 o'clock. Mr. Elliott T. Adams will speak on "Specific Dynamic Action from the Standpoint of the Second and Third Laws of Thermodynamics."

HARVARD UNIVERSITY

FREE PUBLIC LECTURES ON MEDICAL SUBJECTS

THE Faculty of Medicine of Harvard University offers a course of free public lectures on medical subjects, to be given at the Medical School, Longwood Avenue, Boston, on Sunday afternoons, beginning January 3 and ending March 21, 1926. The lectures will begin at four o'clock and the doors will be closed at five minutes past the hour. No tickets are required.

Sunday afternoons at four o'clock.

Jan. 17. Mr. Hermann C. Lythgoe, The Work of the Food and Drug Division of the Massachusetts Department of Public Health.

Jan. 24. Dr. George G. Smith, Gonorrhea and its Complications. (To Men only.)

Jan. 31. Dr. S. Burt Wolbach, Cancer and New Growths.

Feb. 7. Dr. Frederick T. Lord, Certain Aspects of the Diseases of the Organs of Respiration.

Feb. 14. Dr. Reginald M. Atwater, Some Observations on the Progress of Public Health in China.

Feb. 21. Dr. Merrill C. Sosman, The Use and Misuse of the X-ray.

Feb. 28. Dr. William L. Aycock, Modes of Infection.

March 7. Dr. J. Herbert Waite, How one may conserve Eyesight after Mid-life.

March 14. Dr. Frederick C. Irving, Prenatal Care. (To Women only.)

March 21. Dr. Leroy M. S. Miner, Health Service—the Aim of Modern Dentistry.

Copies of this announcement and further information in regard to any of the lectures may

be obtained by addressing the Chairman of the Committee on Public Lectures. The Harvard Medical School, 240 Longwood Avenue, Boston, Mass.

THE AMERICAN CONGRESS ON INTERNAL MEDICINE

ANNOUNCEMENT

THE Tenth Annual Congress on Internal Medicine will be held at Detroit and Ann Arbor, week of February 22-27, 1926.

The Congress is devoted to amphitheatre, bedside and clinical laboratory demonstrations as well as to symposia dealing with modern phases of internal medicine. Distinguished guests from abroad, Canada and the leading clinics of the United States will occupy prominent places on the program. Four days will be devoted to the work at Detroit and on one day, the society will be the guest of the University of Michigan at the newly opened eleven hundred bed University Hospital.

All physicians, who are interested in internal medicine and who are members in good standing of their local and national societies are cordially invited to attend the Congress.

Hotel headquarters will be at the Book-Cadillac in Detroit. Information regarding reduced railroad rates, program, hotel accommodations, etc. may be secured from the Secretary-General.

C. G. JENNINGS, M.D., *President*,
American Congress on Internal
Medicine, Detroit, Mich.

FRANK SMITHIES, M.D., *Sec'y Genl.*,
920 N. Michigan Avenue,
Chicago, Ill.

MEETING AT HARVARD MEDICAL SCHOOL

ON Wednesday afternoon, January 6th, Dr. J. W. Schereschewsky, Director of Cancer Research in the U. S. Public Health Service, addressed a gathering of students at Harvard Medical School on the topic of "Opportunities in Public Health Service." He first traced the history of the Service from its origin in the Old Marine Hospital Service. This was established in 1798 to furnish medical care to sick and disabled seamen of the American Merchant Marine. Numerous marine hospitals were soon built at various ports and on navigable rivers and lakes.

The evolution of public health functions from such a service was along natural lines. The medical officers, in providing care for the American Merchant Marine, were often the first physicians to diagnose such diseases as cholera, yellow fever, and small pox, which were being imported into the United States. During epidemics they were called upon to aid State and local health authorities in giving relief and in

the control of these diseases. By an act of 1893, the powers of the Marine Hospital Service in this regard were extended to include, all infectious and contagious diseases, in co-operation with State and local health agencies.

In addition to the quarantine and hospital functions, the activities of the Service have been enlarged to include research and educational work. The Hygienic Laboratory, established in 1902 for investigative purposes, has grown very rapidly, until now it stands as one of the foremost research institutions in the world. It contains approximately 50,000 square feet of space, has a personnel of 119, and is most excellently equipped for carrying on pathological, zoological, pharmacological, bacteriological, chemical, and physiological work.

The history of the wonderful control of typhoid fever which has taken place in the United States within the past 15 years is a part of the history of the Public Health Service in coöperation with State and local health agencies; and now typhoid fever, which formerly took a toll of more than 50,000 lives annually, is responsible for the death of less than 10,000. In 1912 the service was given power to investigate the diseases of man and the pollution of navigable streams and lakes in the United States.

Under existing authority of law, in addition to its hospital functions, the functions of the Public Health Service are described under the following heads:

- (1) Protection of the United States from the introduction of disease from without.
- (2) Prevention of the interstate spread of disease and suppression of epidemics.
- (3) Coöperation with State and local boards of health in health matters.
- (4) Investigation of diseases of man.
- (5) Supervision and control of biological products such as antitoxins and vaccines, etc.
- (6) Public health education and dissemination of health information.

A candidate for appointment in the regular corps of the Public Health Service is required to undergo a thorough examination before a board of regular medical officers. Persons desiring to enter the corps must be free to serve in any climate, must be between the ages of 23 and 32 years, citizens of the United States, graduates of a reputable medical college, and they must have served in a hospital for one year, or engaged in the practise of medicine for not less than two years.

The examination consists of a thorough physical examination, an oral examination in the various branches of general education and a professional examination in writing in the various

medical subjects. A clinical examination is also given. The successful candidates are recommended to the President and Senate for commissions. During the first four years they are detailed for duty as assistant surgeons in the following order:—

1. United States Marine Hospital.
2. Quarantine station.
3. Immigration station.
4. Hygienic laboratory.
5. Field work in public health.

Promotions are made after four years to the grade of passed assistant surgeon on the strength of further examination. After twelve years of service, officers are eligible to examination for promotion to the grade of surgeon. The maximum annual pay and allowances of an assistant surgeon is \$3,158.00 if he has dependents.

The Public Health service has a broad and varied field of work, including the medical care of certain beneficiaries, patients of the Veterans' Bureau, officers and enlisted men of the U. S. Coast Guard, sailors of the Merchant Marine, etc., at the Marine hospitals; the examination of arriving alien immigrants at ports of entry; the conduct of national quarantine stations; the prosecution of campaigns against epidemic disease; the examination of biological products offered for sale in interstate commerce; the carrying out of research study in the Hygienic Laboratory; and the study of the various factors in the protection of the public health in all parts of the nation.

SOCIETY MEETINGS

DISTRICT MEDICAL SOCIETIES

Essex South District Medical Society

Wednesday, February 3—At 7 P. M. Hawthorne Hotel, Salem. Dr. Walter Timme, New York. Subject to be announced.
Wednesday, March 3—Lynn Hospital, Clinic, 5 P. M. Dinner, 7 P. M. Dr. Charles E. Mongan, Somerville. "Some Problems of Present-Day Practice."

Thursday, May 6—Censors meet at Salem Hospital, 3:30 P. M.
Tuesday, May 11—The Tavern, Gloucester. Annual meeting. Speaker to be announced.

Essex North District Medical Society

May 5, 1924—The annual meeting at the Anna Jaques Hospital, Newburyport.

Middlesex East District Society

February 16—At the Harvard Club. Address by Dr. William F. Boas, subject, "Industrial Poisoning."
April 14—At the Harvard Club at 6:30 P. M. Address by Dr. William E. Ladd, subject to be announced later.
May—Annual meeting, Colonial Inn, North Reading. Subject and speaker to be announced.

Suffolk District Medical Society

January 27—At 8:15 P. M. Combined meeting with Boston Medical Library. "Medical Experience of an Explorer," Dr. J. Hamilton Rice.

February 24—At 8:15 P. M. Surgical Section. "Post-operative Care of Surgical Cases," Dr. Dean Lewis, Chicago. "Surgical Convalescence," by Dr. John Bryant.

March 31—At 8:15 P. M. Medical Section. "Some Experiments in Group Physical Examination," Dr. Roger I. Lee.

April 24—At 8:15 P. M. Annual meeting. Election of officers. "Some Diagnostic, Prognostic and Therapeutic Aspects of Disorders of the Blood," Drs. George R. Minot, Cyrus C. Sturgis and Raphael Isaacs.

Notices of meetings must reach the Journal office on the Friday preceding the date of issue in which they are to appear.